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A CONSERVATIVE LUMBERING OPERATION

By James B. Berry

THAT there is a lumberman who has been operating in virgin timber in Pennsylvania for the past half century seems beyond belief; yet this is what Ex-Congressman N. P. Wheeler has been and is doing in Forest and Warren counties. At present he still holds somewhere between eight hundred and a thousand acres of virgin white pine and a much greater area of virgin hemlock and mixed hemlock and hardwoods; controlling in all something like thirty thousand acres of land, most of which has been cut-over at least once. Stands of thirty-year-old mixed hardwoods—oak, chestnut, beech, maple, birch—are in a flourishing condition and represent a greater value at the present time than did the original stand of white pine at the time it was cut.

Some twenty-five years ago Mr. Wheeler began operations in this immediate section of the state. This period in the history of the lumber industry was characterized by high stumps and wasteful methods. His keen business sense told him this was wrong, and he immediately began the struggle which resulted in making him the peer of conservative lumbermen. His first step was the elimination of high stumps. This aroused considerable antagonism, but his invariable reply to the statement, "that they weren't going to break their backs for anybody" was, "that if they wouldn't, others would," and they did it. And the high stumps, what became of them? Quite as a boast, Mr. Wheeler said, "from those high stumps I made millions of shingles." One by one, the wastes were eliminated, as market conditions improved, until, at present, even the sawdust has a market. The sale of sawdust brought up the question of fuel, and Mr. Wheeler (referring to a small vein of coal on his property) said: "Guess I'll have to turn coal miner in order to keep the mills running."

With good business foresight, Mr. Wheeler undertook to build up permanence among his employees. On Hickory Creek, a few miles above its juncture with the Allegheny, he established his mills and about the mills he built the town of Endeavor. Not a large town but a clean town was his object, and this object has been fully realized; for there is not a saloon, a dance hall or a house of ill-repute within two miles, and that off Mr. Wheeler's property. Both around the mills and in the woods most of the men are married. Rents run from four to eight dollars per month; water is furnished free, unlimited natural gas, one dollar per month; electric lights, ten cents per light per month.

The town boasts of a Presbyterian church, a kindergarten, a graded and high school, and a public library.

Most of his employees have been with Mr. Wheeler for many years; Uncle Frank boasts of forty-six years of continuous service, Jack Hillard of twenty-five, and many others of ten, twelve and fifteen years. All happy and contented, looking to Mr. Wheeler as their adviser and friend. Rare, indeed, is it to find such loyalty to employer or good-fellowship with employees.

A distinction should be made between waste and loss. Waste refers to material which could be utilized at a profit if

Photo by A. S. Rhoades.

"HEART'S CONTENT," A WONDERFUL STAND OF WHITE PINE ON THE WHEELER TRACT—TREES AVERAGING FOUR FEET IN DIAMETER AND ONE HUNDRED AND FIFTY FEET IN HEIGHT—THE DELIGHT OF THE LUMBERMAN AND THE GLORY OF THE FORESTER.

handled rightly; loss refers to material the utilization of which could not yield a profit, or even pay expenses. Thus, a waste may be a loss in one section and a pure waste in another, depending upon one of several factors; namely, market demands, cost and efficiency of labor, cost of transport. Oftentimes a very careful study is necessary to determine whether or not material left in the woods is waste or loss. Where the market demands are weak, with corresponding low prices of material, small, knotty, or crooked logs may not pay the cost of extraction and are a loss. The same result may be due to high cost of labor or high cost of transport. Ten years ago there was little or no cost of labor or high cost of transport. Ten years ago there was little or no demand for hemlock lumber, but there was a strong demand for hemlock bark for tanning purposes; consequently, trees were felled and peeled and left in the woods to rot, a pure loss. During the past few years hemlock lumber has developed a value, and this former source of

loss becomes a source of profit, or a waste if the material is not utilized.

One who is familiar with the North Woods will be greatly surprised at the close utilization on the Wheeler operation. This is, of course, due to better market conditions and better transportation facilities. Everything down to five or six inches in the top is cut into logs, and often the bulk of the slashings are corded for pulp. Stumps are cut low, usually not exceeding one-half the diameter of the butt log in height. Dead and partly decayed chestnut and hemlock are corded for extract. Most of the hardwood material goes to the handle factory, where they can utilize small stuff. There is some talk of installing an acid plant. If this is done, it will utilize the bulk of the hardwood slashing. Cut-over areas in a few years are grown up to seedlings and brush, and an investigation shows that practically all of the old slashings have rotted down to the ground.

Groups of immature or "sap" pine and hemlock are always left for future operations. Not only is there a greatly accelerated growth but these immature trees act as seed trees in the regeneration of surrounding cut-over areas. Hemlock regeneration is very good. Pine reproduction is very light, due to the poor seed crops during the past twelve years. Mr. Throm, Forester for the Company, plans an extensive planting of white pine next spring.

PROTECTION.

The stability of forest operations depends almost wholly upon the cost of protection from the various dangers which threaten the forest; the greatest of which is protection from fire. The practical immunity of the Wheeler tract from fire damage is partly due to the sparsely settled condition of the country, but even more to the high

Photo by A. S. Rhoades.

LUMBERING IN THE HEMLOCK WOODS DURING THE BARK PEELING SEASON, SHOWING THE PEELED LOGS AND PILES OF BARK. AFTER THE LOGS ARE SKIDDED OUT THE GROUND IS NEARLY FREE OF SLASHINGS.

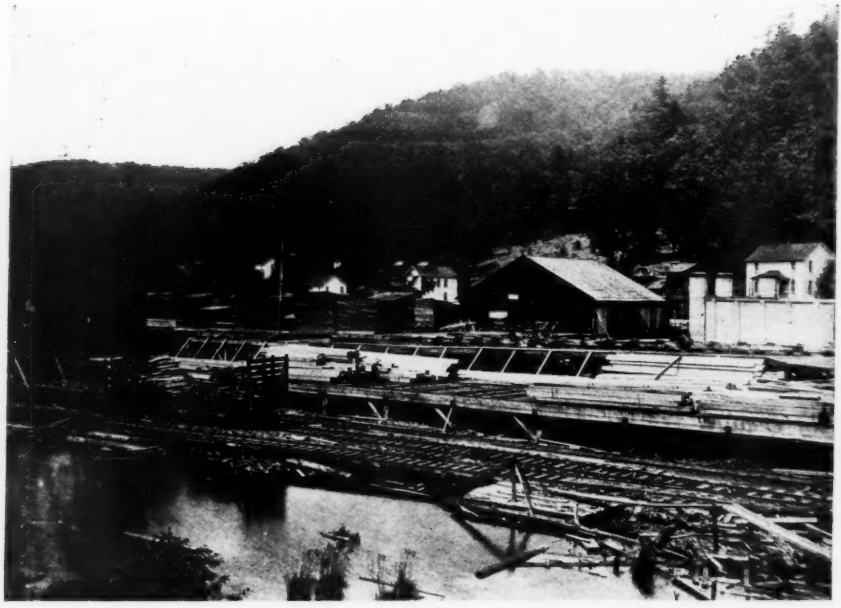


Photo by A. S. Rhoades.

A PORTION OF THE YARDS AT ENDEAVOR SHOWING THE PINE "SORTING" SHED AND, ON THE EXTREME RIGHT, THE CONCRETE DRY KILN. THIS ALSO SHOWS THE CHARACTER OF THE COUNTRY ABOUT THE TOWN.

personal regard in which Mr. Wheeler is held. Every man on the job has orders to report a fire at once; this means the subordinating of all other work to the extinguishment of the fire. Nor does Mr. Wheeler confine his attention to his own property, a fire is a fire and must be investigated, even though ten or fifteen miles off his property. This promptness in getting to the seat of danger has reduced fire damage to a minimum.

The fight against insect enemies has been every bit as strenuous. With the cutting of white pine in the surrounding country, the insects seem to have congregated from every direction to dispose of this final patch of virgin timber. Jack Hillard, the real sleuth in detecting infested trees, first observed the work of the turpentine beetle (*Dendroctanus terebrans*) some seven years ago. He reported the matter to Mr. Wheeler but, because of the fact that no investigations had been made, the damage was ignored. Later, as knowledge of insect damage became more prevalent, Mr. Hillard was placed in charge of the work of saving the timber. His chief source of information was the Bureau of Entomology of the Department of Agriculture. He observed the resinous exudation which marked the place of entrance of the beetle, followed it into its tunnels, or galleries, observed the hatching of the eggs and the work of the larva, and traced the larva down towards the roots where they went into the pupa stage during the winter. He noticed that an infested tree usually died during the second or third year after being attacked. Two problems presented themselves for solution; first, the utilization of the dead and dying trees; second, the extermination of the beetle. The first was comparatively easy; the prices of white pine lumber had reached a point where it would pay to remove isolated trees here and there through

Photo by A. S. Rhoades.

LUMBERING IN THE "BIG TIMBER," SHOWING A FEW OF THE LANDINGS ALONG THE RAILROAD. THE TREES IN THE FOREGROUND ARE GOOD EXAMPLES OF THE WHITE PINE TIMBER.

the forest. These infected trees were felled, bucked up and the logs skidded to a special landing. During the past winter no less than one and a half million feet of dead, dying and down white pine was skidded to "Jack's" landing. (Here we have the evolution of another loss—now a source of profit.) The second problem was the more difficult of solution. Jack reasoned that if the trees were cut while the beetle was in the larval or pupa stages, the bark could be peeled from the infected portion of the stem and burned; and this method was tried for several years. In the meantime the Bureau of Entomology had been experimenting with the result that it was declared not necessary to burn the refuse—merely exposing the immature insect to the elements would destroy it. Last summer Mr. Craighead, Bureau of Entomology, made a special examination of the tract with the result that, in his opinion, Mr. Wheeler was doing more to exterminate the turpentine beetle than any other timber owner in the United States—public or private.

FOREST SCHOOL SUMMER CAMP.

And here it was that the sophomores of the Penn State Forest School spent their summer—or rather, eight weeks of it. The camp proper consisted of a large mess and study tent and ten large sleeping tents, and was situated on the edge of the "big timber," near the logging road, some thirteen miles from Endeavor. An ideal camping place it was; very accessible from town, plenty of good spring water, an abundance of fuel for camp fires, and the most wonderful woods scenery in the country. Still better situated was it for a forestry camp; large lumbering operations (in pine, hemlock and hardwoods) going on all around—ideal conditions for a study of logging in all its

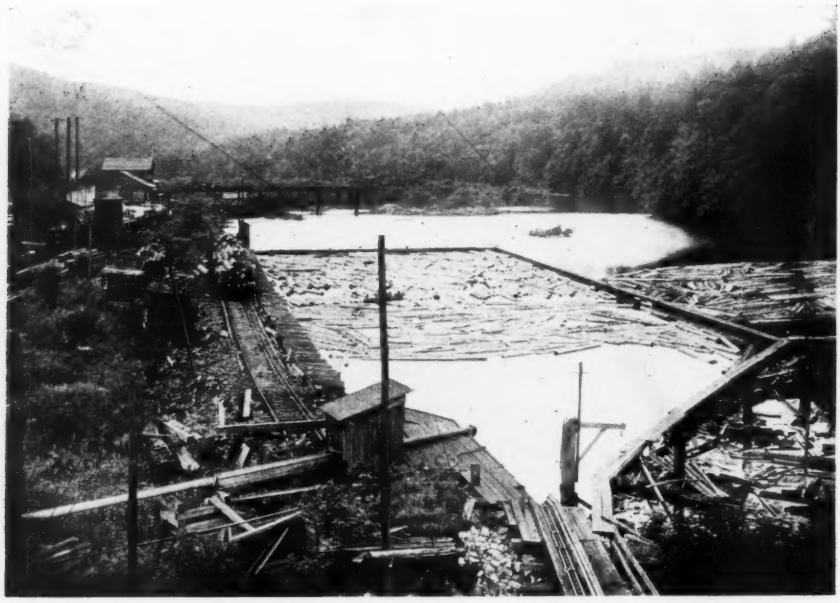


Photo by A. S. Rhoades.
IN THE DISTANCE, THE UPPER OR PINE MILL; IN THE FOREGROUND THE "HOT BOX" OF THE LOWER, OR HEMLOCK MILL.

forms, for studies of growth and volume, for practice in timber estimating and woods survey. During the first month the time was divided between surveying and mapping, dendrology and forest botany; during the second month, between silviculture and mensuration. For a study of milling operations and mill scale study, the camp was moved to Endeavor where every facility was had for complete and careful work. In silviculture, conditions were at hand for a study of forest types, silvical studies, studies of burned-over areas, of logged-over areas, both recent and old, and of second growth at varying ages.

The camp was operated on a cooperative basis—thus keeping the cost of board at a minimum. The expenses of camp, outside of transportation, amounted to about thirty-five dollars per man for the two months. Twenty-six men were in camp during this time.

Professor W. D. Clark had general supervision of the camp and made several visits during the summer. On the ground, Instructors R. R. Chaffee and J. B. Berry had charge of the work; Mr. Chaffee handling the mensuration, Mr. Berry the silviculture. The course of instruction was further reinforced by talks by visitors. Much valuable information was gathered from association with Mr. Craighead, Mr. Hillard, Mr. Wheeler and Mr. Throm.

Everything considered, the camp was a decided success, due almost entirely to the kindnesses and enthusiasm of Mr. Wheeler. Every man who was in camp desires to express his appreciation of these kindnesses and each feels himself under a personal obligation.

C. R. ORTON AT STATE COLLEGE.

Mr. C. R. Orton, of Purdue University, has been elected to fill the vacancy at the Pennsylvania State College, made by the resignation of Professor H. R. Fulton. Mr. Orton took up his duties on January 1, and has charge of the teaching and investigation in Plant Pathology, which includes Forest Pathology as well as the other special courses in plant diseases.

Photo by J. J. Wheeler.

THE 1910 PENN STATE FOREST SCHOOL, SHOWING THE STUDENTS AND A PORTION OF THE CAMP. MR. AND MRS. CHAFFEE NEAR THE CENTER OF THE GROUP.

THE NEW FOREST ASSISTANT

By Jack Welch.

(*With apologies to the author of "The Young British Soldier."*)

When the new-made assistant goes into the West
With a red neckerchief, and a shield on his chest,
He must learn a few things that he hasn't half guessed
Ere he make a good forest assistant.

Now all you collegians appointed next March
To compute volume tables of Lodgepole and Larch,
Just lend your attention and jot on your charts
Some advice to the forest assistant.

First, put the soft pedal on "know it all" brag;
Don't lay down on the job and rely on your "drag";
Have an eye to the gent with the "snipe-bagging" gag
That might queer the young forest assistant.

When the Fall cruising comes in the sleet and the rain,
And your side pardner's grouch almost goes to your brain;
Just look to your compass, and mind how you chain,—
That helps train the young forest assistant.

When your "Annie" is reading 6,000 or more,
And you're blue with the cold and wet to the core,
Remember that others have been there before
And keep on like a forest assistant.

When you're put on a job that's some out of your line,
Don't cuss at the Service and go to resign,
The chief knows more than you, as you will soon find
If you stick as a forest assistant.

Get along with the men that you find on the job
Don't criticize grammar, and set up for a snob.
They were woodsmen ere you learned to puff at a "cob"
And wear a badge like a forest assistant.

Don't think overmuch of the old college days,
Of the girls that you knew,—and the dances, and plays.
But make up your mind that the trail that you blaze
Will help out the next forest assistant.

DO BROKEN BOTTLES START FIRES?

STATE FORESTER WELTY of Washington is investigating the possibility that broken bottles are sometimes the cause of forest fires. He says in a letter to various forest fire protective associations:

"May the mysterious origin of fires in forest material be attributed to broken bottle glass?

"Many fires are reported each season by fire wardens, originating along traveled roads and trails from causes unknown. No doubt, many of these fires can be attributed to the carelessness of travelers along the highways. A cigar stub, cigarette or match carelessly thrown away and left to smoulder is the cause of many fires.

"Some of these fires may have been caused by the sun's action-rays focused through glass bottles discarded by travelers. Those who are familiar with the ways of some woodsmen—be he shanty boy of earlier days in the Eastern States, or the lumber jack of the Western States—know that many an empty bottle has found lodgement in the forest material alongside of road or trail on the way to camp. This is not true of all woodsmen, but some have their failings and have left an empty flask by the wayside.

"Under date of November 17, 1912, Mr. J. Markson, of 3848 East K Street, Tacoma, Washington, in a letter to the State Forester and Fire Warden, writes of his observation and suggests a method for preventing such recurrence of fire in forest material from this cause. His letter in part follows:

"'Eight years ago, while living at Grays Harbor, my duties caused me to cover a good deal of territory in and through the woods. One day at noon I was crossing an unused trail up the Wishkah river, when I discovered a little smoke coming from among a few leaves. I looked about, saw no one, and after carefully investigating, I discovered a BROKEN BEER BOTTLE —the bottom reflecting squarely on the sun's rays, making it act, as it did, a BURNING GLASS. I believe if glass found in the woods, especially in open dry places, was kicked or buried under earth, the glass could not do the work I saw the glass trying to do. Of course, I kicked this bottle under ground and put out the fire just beginning.'

"That some fires were caused by the action of the sun's rays in this way has been entertained by others.

"The suggestion that the sun's rays focused through broken glass bottles may be the cause of some forest fires should be investigated next season by forest fire protective organizations.

"The State Forest Fire Service contemplates such investigation."

A GROUP OF LAPLANDERS ENGAGED BY THE UNITED STATES GOVERNMENT TO TEACH THE ALASKAN NATIVES HOW TO HERD, DRIVE AND HARNESS REINDEER.

REINDEER PROGRESS IN ALASKA

By Lillian E. Zeh

THE herding and breeding of domesticated Reindeer, introduced as an experiment a number of years ago with animals imported from Siberia by the Government, has now become the most prominent feature of the industrial education of the Eskimo and the main activity of many native villages of arctic Alaska. The progress in civilization that has been made by lifting up the natives formerly living as savages, and eking out a precarious existence by hunting with no other domestic animal than the dog, to the estate of civilized, self-supporting herdsmen, as accomplished through the Reindeer industry, is a remarkable educational achievement. The Alaska Reindeer Service has now reached its most successful stage, as it marks the beginning of the period of full utilization of all the Reindeer owned by the Government for the benefit of the native population.

At the present time there is hardly a surplus Government Reindeer north of the Kuskokwim River. This has been made possible by the establishment of new Reindeer Stations, the employment of more natives as chief herders, by accepting the largest practical number of apprentices, and by transferring Reindeer to both chief herders and apprentices in lieu of salary or supplies, the chief aim and fundamental policy of the Government being to turn the Reindeer over to the natives as rapidly as they learn the industry and appreciate its value. The total number of Reindeer in Alaska at the last census was nearly 23,000, and of this number over 11,000 are owned by

the natives. One of the most striking and gratifying features is the large income which the natives derive from the sale of Reindeer products, their share for the past fiscal year having been over $18,000. This amount does not include the value of the Reindeer skins used for clothing, nor that of the meat consumed as food. These material benefits and the very considerable income thus derived demonstrate the fact that the Reindeer industry has become one of the most prominent factors in the economic life of the Eskimo.

The total number of Alaskan Reindeer is distributed in herds among twenty-eight stations, eighteen of these being owned by the Government and ten by Church Missions. The Lapps own over three thousand. The natives are very anxious to get deer and look upon them as a safe investment for their earnings, and usually take deer in preference to cash for services, when an opportunity is offered. The Government does not sell deer, this is done by natives and Missions alone. The various Missions are furnished a herd of one hundred deer on loan for a period of five years by the Government. At the end of this time the original number must be returned. The Mission keeps the increase of fawns, which amount to several hundred, derived from the Government loan. The Moravian Mission of Bethel has one of the largest herds, nearly three thousand. Other Missions having over one thousand deer, all in Arctic Alaska, north of the Yukon, are located at Golovin, Kotzebue, Shishmerof, and Cape Wales. At Barrow, Latitude 71° 25′, the most northern point on the American Continent, there is a herd of 300. The total population here is about 400, men, women and children. One native, "Takpuk," is considered the richest man of that region as he owns a herd of 137 Reindeer. The Missions support and educate a number of young apprentice herders.

The native herders also take on apprentices and award them six deer a year in payment for their services. The Laplanders take a loan of deer for five years from the Government and give their services as instructors for that period. At the end of five years the Lapp returns the 100 deer and becomes an independent herder himself with the large increase of Reindeer he has obtained from the herd. The Lapp herders are not interested in the extension of the Reindeer among the natives. Some of the largest owners of deer are Lapps, some half a dozen of these men having accumulated herds of from five to nearly eight hundred.

In introducing the Reindeer as a means to promote the industrial life and to provide a permanent livelihood for the Eskimo, it has been found necessary by the Government to put the young natives through a course of training. Those who get their deer directly from the Government serve an apprenticeship of five years. There are several hundred of these at present. They are bound by a written contract the strict terms of which they cannot violate without peril of losing their annual allotment of Reindeer and suffering discharge from the service. This caring for, training, and breeding the deer is an education in itself, and the best which the Government could give to the young natives. With careful training the Eskimo boys make excellent herders. They readily learn how to take care of the Reindeer, to throw the lasso, to harness and drive the deer, and to watch the fawns. Siberian herders were first imported to teach them, but of late years the more intelligent and efficient Laplanders, who have learned by centuries of experience the breeding of Reindeer, were secured. The Eskimo boys take quickly to some phases of the work, and in some respects excel the Lapps, they can lasso better than the Lapps, and many become experts in making harness and sleds. The minding of the herd requires constant vigilance, especially in the spring during the fawning season. Then the herders have to keep watch day and night by turns with rifle to protect the herd from the ravages of the Arctic wolf and the dogs.

In the ear of each Government deer a little aluminum button is fastened securely, and all private owners and

A HERD OF DOMESTICATED REINDEER IN ARCTIC ALASKA.

NATIVE ESKIMO WOMAN OF ALASKA RIDING REINDEER TO THE MISSION AT POINT BARROW. THE GOVERNMENT HAS 22,000 REINDEER DISTRIBUTED AMONG 25 GOVERNMENT REINDEER STATIONS, CHURCH MISSIONS AND LOANED TO NATIVES. THE LATTER OWN 11,000 OF THESE USEFUL ANIMALS, WHICH FURNISH THEM WITH TRANSPORTATION, FOOD AND CLOTHING.

herders have a mark which must be registered with a local Superintendent of the Reindeer Station and also at Washington. Besides being taught the art of deermanship the apprentices are instructed in keeping accounts, the methods of marketing Reindeer, and in other practical matters connected with the industry. No apprentice can become a herder unless he is proficient in the branches of elementary reading, arithmetic, and writing. At the end of his apprenticeship the young Eskimo native is allotted a number of deer by the Government, and with the increase obtained during the interval of his five years service, each apprentice will have, on an average, a herd of fifty Reindeer. As this herd will double itself every three years, the graduate apprentice will have a herd which will afford and assure a self supporting income quite enough to satisfy the economic wants of himself and family in the future. He is thus established in business by the Government and is given free pasturage thereafter. The Reindeer produces one fawn in the spring each year for ten years.

Among the useful and profitable products of the Reindeer are the skins for clothing. Of these pelts most varied use is made. From them are fashioned the tight-fitting trousers and that wonderful outer garment, the "parka," universally worn in winter by both male and female natives and by many whites. The "parka" extends to the knees and has a close-fitting hood, which keeps the head and shoulders comfortably warm even in the severest weather. These Reindeer garments are remarkable for their excellent qualities of resisting moisture and cold. A close examination of the hair of reindeer furnishes an explanation of its peculiar value. The hair is not merely a hollow tubular structure, with a cavity extending throughout its entire length, but is divided, or partitioned off, into exceed-

ANOTHER VIEW OF A HERD OF THE DOMESTICATED REINDEER SHOWING IN THE BACKGROUND THE NATIVES WHO OWN THEM AND THE HOUSES OF THE NATIVES.

ingly numerous cells, like watertight compartments. These are filled with air, and their walls are so elastic and at the same time of such strong resistance that they are not broken up either during the process of manufacture or by swelling when wet. The cells expand in water, and thus it happens that a person clad completely in garments made of reindeer wool does not sink when in water, because he is buoyed up by the air contained in the hundreds of thousands of hair cells.

As the mineral industry continues to grow in Alaska the natives and graduate apprentices can earn high wages as teamsters hauling supplies and furnishing fresh reindeer meat to mining camps in the interior, at points remote from railway and steamboat transportation. Well trained sled deer have been used to carry the mail 650 miles from Barrow, South to Kotzebue. This is the most Northern mail route in the United States, and likewise the most perilous and desolate mail trip in the world. Two trips are made a year and $750 is paid for each journey. The average speed is about 40 to 50 miles per day, keeping up a steady trot.

One of the latest and quite remarkable feasts showing the capacity of the reindeer for sledge driving was that accomplished by Mr. W. T. Lopp, the Superintendent of the Government Reindeer Service. During the recent winter's tour of inspection, Mr. Lopp traveled more than 2,500 miles with a reindeer sled over the frozen tundra and ice-bound rivers of the lower Bering Sea region from the middle Yukon to the coast of the North Pacific. Part of this route for several hundred miles lay through a country which had been so little traversed that not even native trails had been made. The Alaska Reindeer Service is under the direction of the U. S. Bureau of Education.

PROTECTING THE FORESTS

MR. CURT THIERSCH of New York City sends AMERICAN FORESTRY the outline of a bill which he says will be introduced in Congress. It provides for the planting of broad belts of foliage trees throughout pine tree forests.

Mr. Thiersch says: "It is generally known that the uncontrollable and the irresistible speed with which forest fires travel is almost invariably due to the presence of conifers. The resinous pine trees, burning like torches, are ideal fire conductors, while foliage trees, owing to the total lack of resin in their trunks and branches and to the moisture of their leaves, burn slowly and smoulderingly, as they afford poor food to the flames. By planting broad zones or belts of foliage trees through the forests of conifers, the forests would be supplied with an admirable natural preventive against the growth and spreading of devastating forest fires. It will, of course, be necessary to make the foliage tree belts amply broad, in order that they may successfully combat the spreading forest fires. There is an imperative need to conserve and replenish our rapidly disappearing forests, and by planting protective belts of foliage trees this end would be compassed without undue difficulties and at a comparatively moderate cost. The initial outlay would be abundantly compensated for by the valuable timber thus grown. Furthermore, the foliage tree belt would be of incalculable advantage in strengthening the fire lines which are located at critical points."

MORE LAND FOR THE CORNELL FORESTRY DEPARTMENT.

The equipment of the Department of Forestry at Cornell has just been increased by the gift of 200 acres of land. This land is situated only about three miles from the University campus, and is within a half mile of a railroad depot. The land forms a desirable addition to the eight woodlots and the farm of thirty-eight acres which have previously been given to the Department, all of which are situated within two miles of the University.

A CHINESE ARBOR VITAE TREE GROWING IN A TEMPLE COURT IN CHINA. THIS TREE IS BELIEVED TO BE BETWEEN 800 AND 1,000 YEARS OLD. IT IS ABOUT 60 FEET IN HEIGHT AND ABOUT 12 FEET IN DIAMETER.

CHINESE ARBOR VITAE

By CHAS. A. SCOTT,

State Forester, Manhattan, Kansas.

AS a result of the work of plant introduction, some very valuable trees for planting in various parts of the United States have been brought in from foreign countries. Among these the Chinese arbor vitae deserves special mention because of its qualities that adapt it for planting in dry regions.

The Chinese arbor vitae is an evergreen tree that resembles the American arbor vitae closely in leaf characteristics, but it is altogether unlike it in regard to its soil and climatic requirements.

The Chinese arbor vitae is found growing in very dry mountainous regions in China, enduring extreme cold in dry locations, but unable to endure the winters where the humidity is great. It is a tree that has been planted extensively throughout the drier parts of China for ornamental purposes. In the temple courts and burial grounds specimens have been found that exceed 1,000 years of age. These trees are of extreme size, attaining a height of fifty or sixty feet and from four to twelve feet in diameter. It is a tree that readily adapts itself to a very wide range of soil conditions, growing thriftily in sandy soils as well as in hard clay soils, and in many instances is found growing in soils strongly aklaline.

It is less than twenty years ago since

A DESIRABLE FORM OF THE CHINESE ARBOR VITAE FOR ORNAMENTAL PLANTING. THESE TREES ARE SIX YEARS OLD FROM SEED AND RANGE FROM SIX TO EIGHT FEET IN HEIGHT.

this tree was introduced into the United States. It has been planted quite extensively throughout Southwestern Kansas and Oklahoma, and wherever found, it is making a splendid growth. The trees show no indication of injurious effects from either the drought, heat or cold that has been experienced in this time. It is a tree that should be used extensively for woodlot, windbreak, and ornamental planting throughout the southwestern states.

When grown in the woodlot, it should be planted closely so as to shade off the lower limbs and develop a straight clean stem that will yield poles and posts. As a post timber, it is very durable, comparing favorably with the American arbor vitae (white cedar).

For windbreaks, three or more parallel rows should be planted eight feet apart and the trees set six feet apart in the row, the trees in one row alternating with the trees in the adjacent row. In ten or twelve years these trees will form a solid wall of limbs and foliage from the ground to the height which they attain. During youth, the Chinese arbor vitae grows quite rapidly, the annual average height growth varying from fifteen to thirty inches per

A CLUMP OF 12-YEAR-OLD CHINESE ARBOR VITAE TREES GROWING IN THE CITY PARK, MANHATTAN, KANSAS. THEIR DENSE FOLIAGE GIVES ALMOST COMPLETE PROTECTION AGAINST SEVERE WINDS.

year, depending upon the character of the site.

For ornamental planting care should be taken to select suitable specimens for this purpose, the most desirable being low, compact trees with dense foliage. The foliage of the Chinese arbor vitae is a deep green throughout the summer, changing to a dull brown with the approach of winter. The deep green is again resumed during the first few days of warm weather in the spring.

A commendable feature of the Chinese arbor vitae is the ease with which it transplants. Nurserymen who have handled it in large numbers, say that there is no more loss in transplanting the Chinese arbor vitae than there is in transplanting the cottonwood.

HARDWOOD MANUFACTURERS MEETING.

President W. E. DeLaney, of the Hardwood Manufacturers' Association, has issued a call for the Annual Convention of this Association to be held at the Hotel Sinton, in Cincinnati, February 4th and 5th, 1913. This convention is the country's largest annual gathering of lumbermen, representing something like three billion feet of standing timber.. The convention attracts something like six hundred delegates, practically all of whom are owners of timberland or mill operators.

There will be an elaborate program of interesting topics—the program not yet having been outlined—and the social features of the Convention will, of course, be as usual, attractive.

SIXTEEN YEARS AFTER

IN his annual report for 1912, Secretary of Agriculture Wilson devotes considerable space to a review of the work which has been done by the Forest Service in the sixteen years of its existence and the conditions which faced it at the beginning and during that period. He says in part:

"Forestry in the United States at the beginning of 1897 was still in its dark ages. Its general practice seemed about as imminent as when Columbus first set foot upon the shores of a new world. A few far-sighted and public-spirited men had tried from time to time to arouse realization of the danger that lay ahead if wasteful destruction of a great primary resource were not checked; but they were as voices crying in the wilderness. Their warnings were, on the whole, rather less productive of results than had been similar warnings in colonial days.

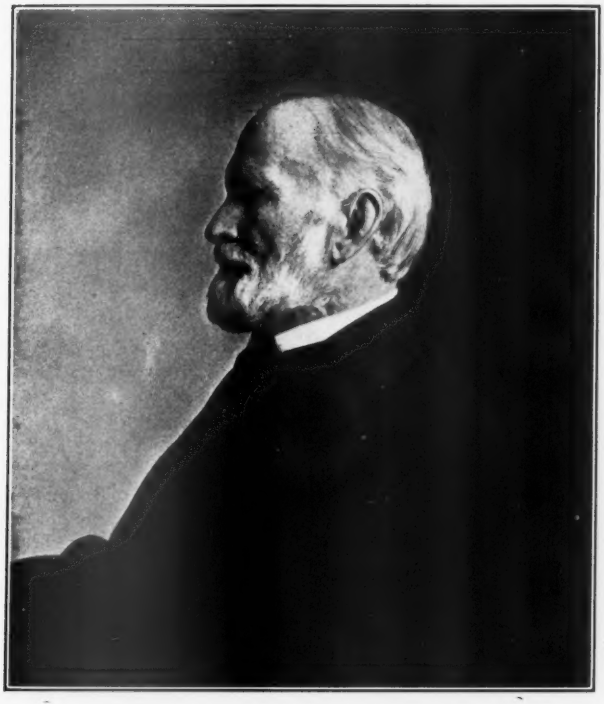
"Unquestionably one reason why predictions of direful consequences in store if waste were not curtailed aroused little interest was the fact that the cry of 'wolf' was so old. The history not merely of agitation but of legislation with regard to forests reaches back into the early days of settlement along the Atlantic coast. Laws for the care and protection of forests were placed upon the statute books of several of the Colonies.

"Late in the eighteenth and early in the nineteenth century agricultural societies in Massachusetts and New York acted on behalf of forest protection and promotion of the growth of forests. Between 1799 and 1831 Congress legislated again and again with a view to insuring the maintenance of supplies of live oak. In 1867 horticultural and agricultural societies in Wisconsin appointed a committee to report on the results of forest destruction. Laws for the encouragement of tree planting were passed between 1868 and 1874 in nine Western and two Eastern States. In 1869 the board of agriculture of the State of Maine took action toward the formulation of a forest policy. Arbor Day was instituted in 1872. In 1873 Congress passed the first timber-culture act. The American Association for the Advancement of Science appointed in the same year a committee to memorialize Congress and State legislatures upon the importance of promoting the cultivation of timber and the preservation of forests. The American Forestry Association was founded in 1882 and the Pennsylvania Forestry Association in 1876. The latter year marked the inauguration of forest work by the Department of Agriculture.

"These are scattered examples of organized action to meet either a recognized or a supposed danger. The forest destruction was proceeding apace and threatened serious consequences had been the declaration of some observers from early days down. Those who govern their course by rule of thumb instead of by a careful analysis of conditions, and therefore hold that only what has happened will happen, were inclined to be more than skeptical concerning the existence of this particular wolf. The alarm had been raised too often. Cassandra prophecies of the approach of a timber shortage were generally received with tolerant incredulity when they did not call forth outspoken contempt.

FEAR OF WOOD FAMINE IS RECENT.

"The opinion was still commonly advanced that the forests of the country were inexhaustible. Practical men who had had sufficient opportunities of observation to know the contrary were content in the thought that the supply would last their time. Such an attitude was the more readily justified by the fact that no matter what convictions were held on the subject there appeared to be nothing in particular that anybody



SECRETARY OF AGRICULTURE JAMES WILSON.

could do about it. Economic conditions were thought not ripe for a change. Wasteful exploitation must run its course, it was argued, and a great national asset continue to vanish in smoke until the price of protection became worth while and until the market value of a tree made growing it good business.

"It may fairly be said that half a generation ago the fear of a wood famine was a matter that had not entered the field of vision of the average man. Some sagacious ones, it is true, were giving practical but unostentatious evidence of their capacity to see ahead by gathering into their ownership all the cheap timberlands that they could acquire. Thus were laid the foundations of great fortunes. Timber reservations by no means began with the Government. The proceeds of lumbering in the virgin forests of the Northeast and in the matchless Lake State pineries, once Government owned, were often reinvested in southern yellow-pine lands or in the cream of western timber. This, however, was foresight exercised for private ends. Those who put their money into such investments counted—and with reason—on diminishing supplies to force up the value of their holdings. But those who urged the necessity of public action to provide for future public needs were thought to be disturbing themselves unduly in matters which were proper subjects for the attention of Providence rather than of men. To concern oneself overmuch lest wasteful use of the resources placed at human disposal might leave posterity with nothing to use argued a lack of confidence in the Divine wisdom which had put us in a world designed for the satisfaction of all essential needs. If the forests should ever fail, there would be something better to take their place.

"This optimistic point of view was fostered by the very circumstances

which in reality gave greatest cause for apprehension. Unexpected and momentous changes had revolutionized the conditions on which had been predicated the early forecasts of approaching need. While by falsifying these forecasts they had operated to lull the public mind into a feeling of unjustified security, they had actually created a situation a hundredfold more serious than before. In the eighteenth and early nineteenth centuries the question of forest supplies was purely local. Transportation except by water for any great distance was out of the question for so bulky a commodity.

AWAKENING TO THE PROBLEM.

"With the development of railroads affairs took on a wholly new aspect. Continental supplies were substituted for local. In the mid century the forests about the Great Lakes began to melt away, going east, west, and south, to rise again in the countless homes of an expanding nation. From open prairie to seaboard cities, from the factory towns and hamlets of New England to the growing commercial centers and the multiplying crossroad villages of the Middle West, they fed prosperity, and fireswept desolation blotted the land of their origin.

"Thus was created a problem which is now not nation-wide, but world-wide. New York bids against South America and the Orient for the timber of the Pacific Northwest. Southern pine goes by water from the Gulf to Great Britain or the North Atlantic States; by rail, to meet the output of Montana's forests on the plains. In 1911 the United States exported domestic forest products to a total value of over $100,000,000, of which Europe took over $55,000,000 worth and South America about $25,000,000 worth. All the countries of eastern Europe must import timber to meet the excess of their needs over the home supply. Meanwhile, with an estimated home consumption of 23 billion cubic feet of wood annually, our depleted and abused forests are producing by growth probably less than 7 billion feet. The Bureau of Corporations of the Department of Commerce and Labor estimates the existing supply of saw timber in the United States at less than 3,000 billion board feet, which is equivalent to about 500 billion cubic feet. Economists now recognize that taking the world over, wood consumption exceeds its growth, and that a crisis approaches.

"That some measure of public provision has been made for maintained supplies of a great public necessity; that we are not merely 16 years nearer the time when wood shortage will handicap building, mining, and manufacturing, the railroad, the merchant, the farmer, the wage earner, and the consumer; that one-fifth of the standing timber in the United States is not only held and protected in national forests, but also open to use under methods which will mean increasing production through growth and successive harvests for all time; that the public is fully awake to the importance of preventing forest fires everywhere, and of substituting forest management for forest exploitation; that private owners recognize in forestry not an impracticable counsel of perfection and a fad of theorists but a tangible business proposal; that lumbermen show a growing realization of the fact that their industry is one affected with a public interest, and therefore involving a public responsibility; that immense gains have been made in reduction of waste and increased length and amount of service obtainable from what is cut; that conservation of natural resources has become an accepted public policy and a clearly perceived matter of national welfare—all these are results primarily and directly due to the work of this department within the last 16 years.

"Solely to that work is due the fact not only that the great bulk of the national forests were ever set aside, but also that the justifiable demand for the supply of immediate needs has not been confronted by a flat taboo upon use which would have meant the abandonment of reservations already made. Solely to that work, again, is due the fact that the practice of technical forestry in the United States has been made possible by the gathering through

the years of the basic scientific knowledge on which alone good practice can be founded. Had this great work not come when it did, most of our remaining publicly owned forests would have passed forever from public possession and private monopoly would now be forging its fetters with no prospect of relief save by the slow and difficult procedure of legislation in the face of vested rights.

"In retrospect one central fact stands out—that the key to the whole situation was seized when the practice of forest conservation was shown to involve not the rearing of blind barriers against the utilization of resources, but the development of resources through wisely regulated use. For passive prohibitions were subtsituted constructive activities."

PENNSYLVANIA FORESTRY ASSOCIATION

A WELL attended annual meeting of the Pennsylvania Forestry Association was held at Philadelphia on December 9. The following officers were elected: President, John Birkinbine; vice presidents, Robert S. Conklin, Wm. S. Harvey, James C. Hayden, Albert Lewis and Samuel T. Smedley; general secretary, Dr. Joseph T. Rothrock; recording secretary, F. L. Bitler; treasurer, Charles E. Pancoast.

Dr. Henry S. Drinker, on behalf of the Legislative Committee, gave the prominent features of the work of the committee in preparing bills for presentation to the Legislature creating auxiliary forest reserves, and their taxation. The subject was discussed by Messrs. Robert S. Conklin, John Birkinbine, Joseph Johnson, W. W. Montgomery, Samuel Marshall, Samuel L. Smedley, and others. The committee also reported a conference with the Game, Fish and allied associations, where the legislation required for forest protection was discussed. The Association approved the action of the committee and continued it.

Mr. Mark A. Carlton, general manager of the Chestnut Tree Blight Commission, described the work which they had been able to accomplish during the year. According to a map which was exhibited, the disease had been eradicated in the western half of the State, over 32,000 infections having been destroyed. Coming eastward, the work was more difficult, there being so many more cases of contagion, but it was hoped by January 1st to complete the work to a curved line extending in a general north and south direction near the Susquehanna River.

In the course of his address, President Birkinbine said:

"The General Assembly which meets in January will be again asked to pass legislation which will equitably tax forested lands, on a basis radically different from that now in force, whereby forest owners are practically penalized for permitting trees to reach maturity. A committee of the Association has given the subject most patient study, and acquainted itself with the forest taxation laws of the various States, investigated the problem in all its phases; so as to formulate bills which the Association can commend to the Legislature as equitable to the forest owner, to other taxpayers, to the various counties and to the State. While these bills are sponsored by the Pennsylvania Forestry Association, and by the Pennsylvania Conservation Association, they will need the individual endorsement of members to convince legislators that their constituents wish them to become laws. Personal endorsement is the only medium by which a member of the Legislature may recognize the desire of his constituents, and favorable comment of the press may also result from an individual presentation of the subject to editors."

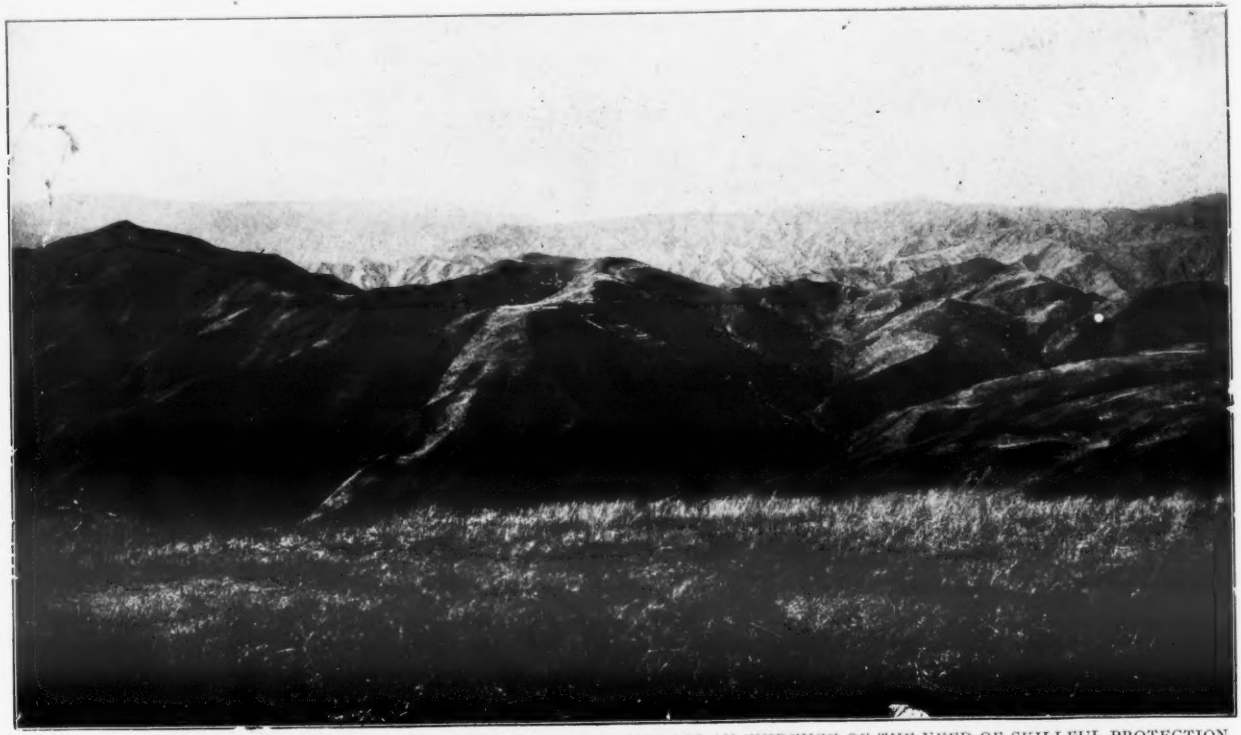
THE FOREST SERVICE IN 1913 AND 1914

WORK of the Forest Service for the ensuing year will follow, in the main, the same lines as that of last year, says Chief Forester Graves in his report for 1912. The scope of many projects will be broadened, certain closely related lines of work will be taken up, and every effort will be made to bring to completion such work as can be accomplished in a comparatively short time. So many of the investigations and experiments described in the body of this report must of necessity extend over more than one year that specific mention of a number still under way will not be made.

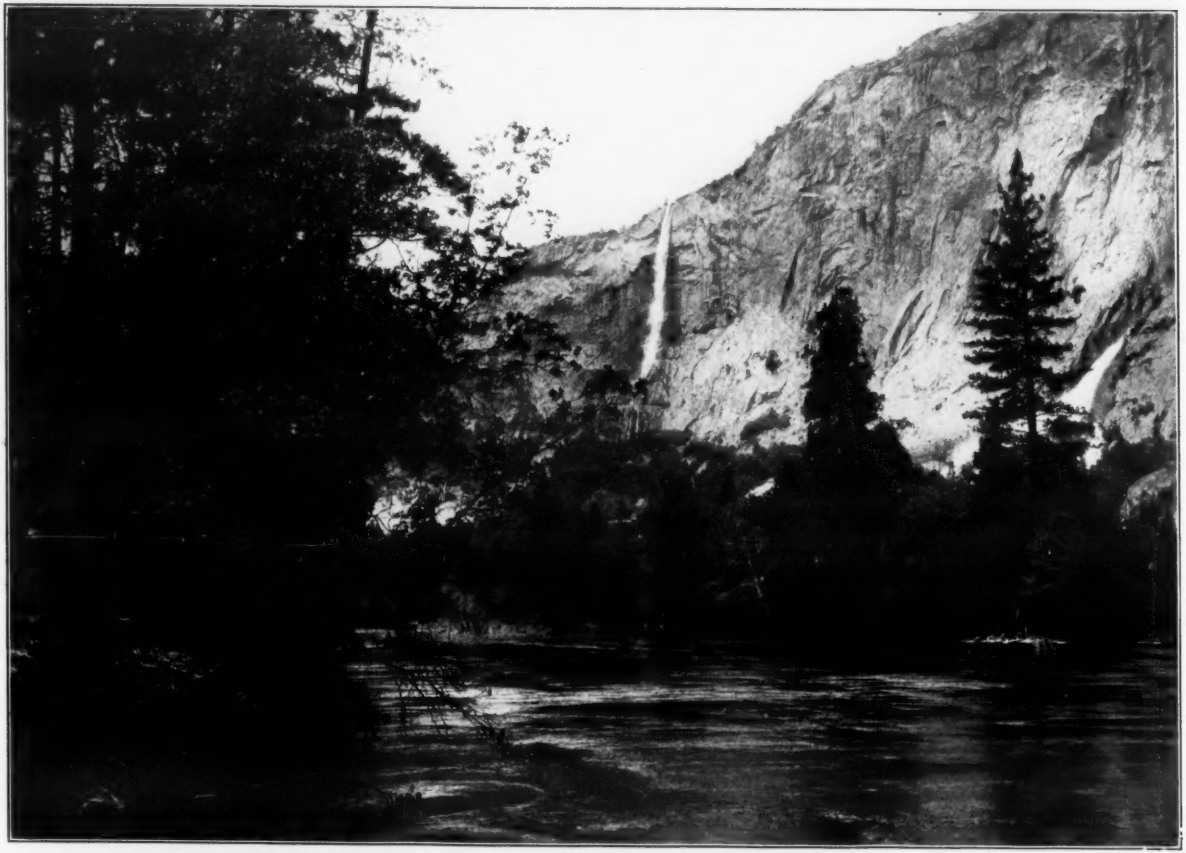
"The classification, survey, and listing of national forest lands chiefly valuable for agriculture, provided for in the appropriation act of August 10, 1912, will be begun. Men well qualified by training and experience will be selected to have direct supervision over the work, to which they will give their entire time and attention. Experts from the Bureau of Soils will assist in the classification. Field examinations will be detailed and thorough, and will take into account all factors, such as climate, topography, soil, stand of merchantable timber, and value for purposes other than agriculture, influencing the comparative values of the lands examined. Parties have already been organized and are proceeding with the work on eight forests. This work will be extended to other forests as rapidly as men are available. Effort will be made to sell the stumpage on agricultural lands listed as temporarily more valuable for timber, in order that these lands may as soon as possible be opened to entry. The great area to be classified and the necessity for thorough and painstaking examinations will necessarily cause the work to be extended over several years. It will, however, in no way interfere with the regular handling of applications for homesteads under the act of June 11, 1906.

"The work of preparing detailed fire plans for the national forests will be carried forward as rapidly as possible. Along with this will go further study of effcetive means of locating and reporting fires and of how to use the small protective force to the best advantage. Lookout stations will be established and equipped, trails and telephone lines constructed, and fire-fighting equipment purchased to the extent that funds permit. A great deal of attention will be given to the problem of bringing home to the public the necessity of co-operating with the service in the prevention and suppression of forest fires.

"In conformity with the plans outlined in the body of this report, effort will be made during the year to bring the total amount of timber sold as nearly as possible up to 3,000,000,000 feet. As one of the means of accomplishing this, improvement will be sought in methods of advertising and in otherwise bringing available timber to the attention of prospective purchasers. Particular attention will be given during the year to the development of a policy for large sales that will be practical from the standpoint of the lumberman and that will at the same time insure protection to the interests of the United States. A modification of the timber-sale policy regarding small sales will be made necessary by the provision in the agricultural appropriation act for the fiscal year 1913, which directs the Secretary of Agriculture to sell at actual cost to homestead settlers and farmers, for their domestic use, the mature dead and down timber in national forests. Heretofore the law has provided that sales of national forest timber not exceeding $100 should be made at its appraised value, and that timber of value exceeding $100 should be advertised for at least 30 days and disposed of to the highest bidder. Under the present amendment timber



MOUNTAINS OF CHINA, ONCE HEAVILY WOODED, NOW BARE. HERE IS AN EVIDENCE OF THE NEED OF SKILLFUL PROTECTION OF OUR FORESTS. THESE MOUNTAINS OF SHAN-SI PROVINCE, ONCE HEAVILY WOODED WITH PINE FORESTS, ARE NOW TREELESS, DUE TO THE DESTRUCTIVE CUTTING OF THE FORESTS.



A SCENE ON THE NATIONAL FOREST IN HETCH-HETCHY VALLEY, CALIFORNIA. TUENLALA FALLS VIEWED FROM ACROSS THE RIVER AND WAPAMA FALLS JUST VISIBLE ON THE RIGHT.

A SCENE ON THE NATIONAL FOREST IN HETCH HETCHY VALLEY, CALIFORNIA. TUENLALA FALLS VIEWED FROM ACROSS THE RIVER AND WAPAMA FALLS JUST VISIBLE ON THE RIGHT.

DEFORESTATION CAUSES FLOOD.

A view in a Georgia Forest where flood conditions are caused by deforestation at the stream sources. Acquirement of Southern Appalachians as a National Forest is largely preventing such damage.

desired by homestead settlers and farmers for their own use will be sold to them without advertising at a price based upon the cost per thousand feet of making and administering such sales.

"Preparation of working plans as a means of systematizing and placing upon a definite, clean-cut basis the management of the different forests will be continued. Forests where the use of one or more resources is very intensive, or promises to be in the near future, will be given first attention. Preliminary plans will be prepared for all forests as rapidly as possible. As a basis for the work, timber reconnoissance will be extended to cover as many new forests as the force and money available will permit.

"During the winter the central investigative committee will meet, and, with the recommendations of the various district committees before them, will pass upon plans for investigative work of the entire service during the following season.

"As indicated in the body of this report, reforestation work during the coming year will be confined to experimental studies and to the reforestation of approximately 30,000 acres, or as near that area as available funds will permit. As a result of the work carried on during the past year, experiments in reforestation will be conducted with a more definite idea of the lines along which the work should be concentrated. In the actual reforestation it will be possible to devote much attention to perfecting methods to secure better results in large operations and to reduce costs.

"The establishment of local experiment stations on national forests has been so fruitful of results that the system will be extended to include additional forest types and regions in the Northwest. In studies at the experiment stations special emphasis will be laid on methods of cutting the different types of forest to secure natural reproduction. The general study of forest types and the physical factors which determine them will be continued. The study of the relation of forest cover to streamflow now being made at the Wagon Wheel Gap Station in the Rockies will, in all likelihood, be extended to the Southern Appalachians. During the coming year the timber on one of the two watersheds at Wagon Wheel Gap will be cut and sold and the slash burned. This will give for the first time an opportunity to compare the regimen of streams from protected and unprotected watersheds, the difference between which was definitely established before any change in their surface cover took place. In co-operation with the University of Wisconsin, problems relating to the forests of Michigan, Minnesota, and Wisconsin will be studied at the experiment station at Cloquet, Wis.

"Much attention will be given during the year to problems of forest mensuration. In the past, work along this line included only the collection and tabulation of field measurements on growth, volume, and yield of trees. A large amount of the data thus far collected will be analyzed during the coming year and an attempt made to establish general laws of tree growth.

"The grazing reconnoissance on the Coconino, Tusayan, Targhee, Manti, Medicine Bow, and Minam Forests will be completed, and the work extended to others. General grazing studies will include collection, identification, and determination of the economic value of approximately 6,000 specimens of range plants; means of securing natural revegetation of depleted lands by alternation in the use of ranges; methods of handling stock by which waste and damage may be minimized, fire danger reduced, new ranges utilized, and the stock improved; and methods of developing water for stock upon arid ranges. More intensive investigations will include the effect of overgrazing upon stream flow, erosion, and forest reproduction, and the possibilities of artificial reseeding and of growing seed for regeneration of ranges. In connection with the grazing studies, an experiment station has been established on the Manti National Forest, known as the Utah Experiment Station, where special stress will be laid on investigations relating to the effect of grass cover and

A VIEW IN THE CLEVELAND NATIONAL FOREST.

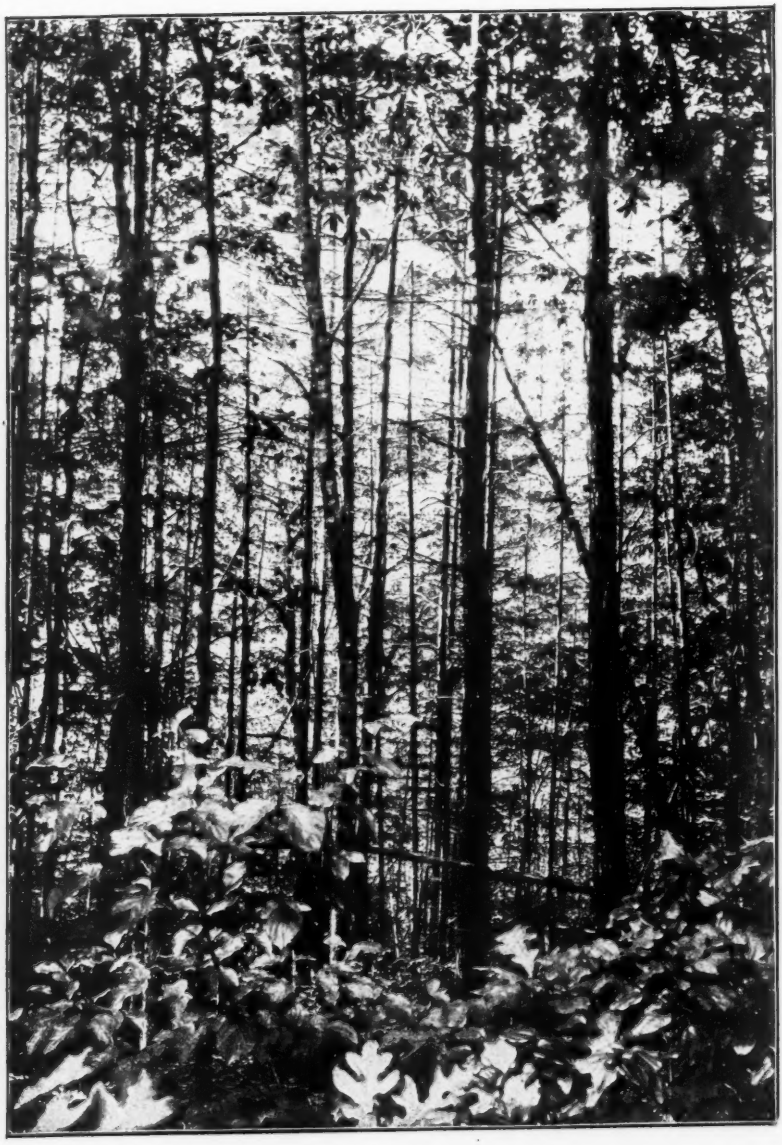
Forest Rangers perched on top of Taggart Rock, the summit of Tocquitz Peak, Old San Jacinto.

grazing upon floods, erosion, and purity of water supply.

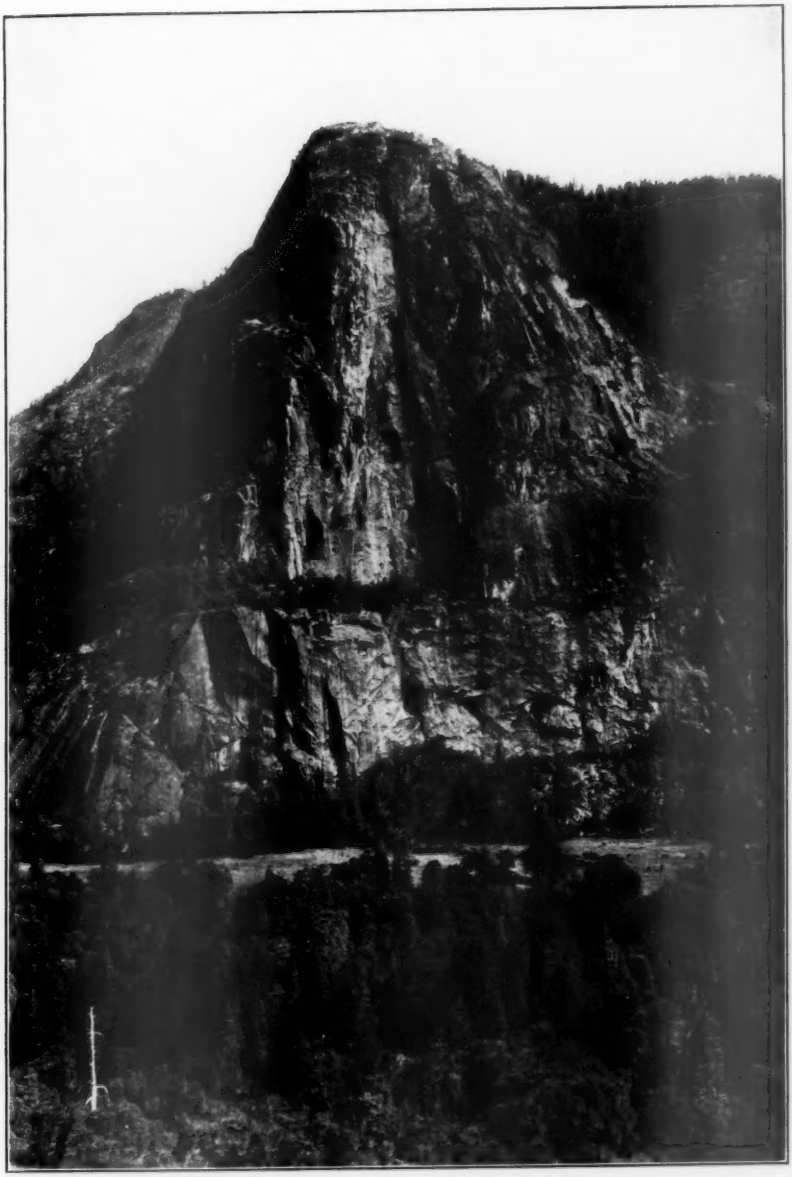
"Co-operation with the States in fire protection under the Weeks law will be continued, and the benefits of the act extended to as many new States as possible. A meeting of State officials will be held in order to arrive at the best policy and method of protection. Inspection will be made by the Forest Service to insure that the money appropriated among the various States is being properly expended. To continue the co-operative work beyond the close of the calendar year 1912 an additional appropriation under the same terms as the first one will be needed.

WORK FOR THE YEAR 1914.

"Broadly speaking, the work of the Forest Service in 1914 will deal with the same general problems that have



WHITE PINE FOREST ON THE SOUTHERN APPALACHIAN FOREST RESERVE, SHOWING REPRODUCTION ON CUT OVER LANDS.



KOLANA ROCK, HETCH-HETCHY VALLEY.

confronted it in recent years. As progress is made along the different lines of work new fields for study and investigation present themselves. The development of methods suitable to one region perhaps calls for the development of other and wholly different methods for another one. With the steadily increasing use of the national forests new problems, which must be met and solved, constantly arise in connection with their management.

"One important extension of work in 1914 will be in connection with the new national forests in the East. By the beginning of the fiscal year title to some 500,000 acres of land in the Appalachian and White Mountains probably will have passed to the Government, and this area and additional areas acquired during the year will be put under administration. Since these forests are in the center of a region of large population, their use should be intensive from the first. To handle the investigative problems in connection with management of the eastern forests, experiment stations will, if funds are available, be established to conduct studies in the different forest types. Adequate means of fire protection suitable to the region will be developed and preliminary work done in the reforestation of denuded lands.

"The work of classifying national forest lands, as provided for in the act of August 10, 1912, will be continued through the year, and every effort will be made to bring the work as far toward completion as possible.

"During the year results of the policy of making large timber sales should become manifest in a greatly increased cutting of national forest timber. Reforestation to about the same extent as in the previous two years will be continued, but, guided by past investigations and results, with improved methods and, it is hoped, at lower cost. Working plans for some of the forests whose resources are intensively used will be brought to completion and substantial progress made toward the completion of preliminary plans for all forests. If funds are available the system of experiment stations will, in all likelihood, be further extended to cover additional forest types in the West.

"Grazing reconnoissance will be extended to a number of new forests. Studies in connection with the effects of grazing upon stream flow, erosion, and forest reproduction, reseeding of range areas, revegetation of depleted lands, and of various methods of handling stock will be further developed.

"Co-operation with the States in fire protection will be carried forward if a further appropriation is provided for that purpose. On the national forests the work of preparing detailed fire plans and of devising means of adequate fire protection will continue to receive the attention that the urgency of the problem demands.

FOREST THOUGHTS.

By Augusta Eccleston Campbell.

May each new leaf an idea bring
Of love of woods, a bird to sing,
A flower to bloom, a tree, a spring.

* * *

The arms of trees in reverence raise
Their supplication and their praise,
The prayer to Man, the praise to God.

A VERY FAVORABLE CONDITION FOR BURNING PILED BRUSH.

SAFEGUARDING LOGGING OPERATIONS*

By Douglas Rodman

THE protection of logging operations from fire is just as necessary as is insurance on a sawmill. You can insure a mill but you cannot insure timber. All you can do is to protect it.

When the need of protection, which is so obvious as to make its discussion here unnecessary, is fully realized, the first step has been taken.

This need is so great that it now seems poor policy to neglect any point which makes for better protection. This is due, of course, to the greatly increased value of the stumpage and logging equipment, to bigger operations and more intensive management.

The second step naturally involves means for protection. This would logically take one of two courses: either the present methods of logging would be changed, or else the existing methods would be made as nearly fireproof as possible.

Electric, instead of steam logging equipment, would eliminate the greatest elements of danger from fire. The C. A. Smith Lumber Co. has had under way for some time experiments with electric logging machinery. The danger of fire getting out from an electric donkey is practically none. And the cost of logging will be considerably reduced. But while there is every indication that

electric logging is practical and economical, it is not yet beyond the experimental stage.

So in most logging operations the means of protection involves the handling of the usual steam equipment, in a manner that will reduce the fire risk to a minimum. The exceptions would be those operations where the local conditions make oil-burning machines practicable.

It is taken for granted that it is unnecessary to discuss here the urgent need for the equipment of donkeys with spark arresters, hose and fire-fighting tools. The need of this equipment has been proved so often and so conclusively that there can be no question of the importance of having it.

Slash burning, the falling of dead snags, and the clearing out of a fire line between the logging operations and the timber would, of course, be desirable.

But, however complete the fire equipment may be, and however much care may be taken to prevent fires, it is probable that fires will get out.

What are you going to do then? In some cases there has been confusion, with resultant delay, and a big fire. How can this confusion be avoided?

Since the need for fire protection, and the means for securing this protection are becoming generally recognized, this question seems vitally important: What are you going to do if a fire gets out?

In a sawmill there can be a fire drill which will train every man to know his place if a fire starts. We cannot go to this extent in the woods, but we can have better understanding, better organization and a better attitude towards the fire question.

ATTITUDE OF THE OWNER IMPORTANT.

When the men understand that the owner will not tolerate fires a step will be taken towards preventing them. For many fires that start some one is to blame. Maybe it is a donkey driver who has punched the screen full of holes to increase the draft. Possibly a section crew that has seen a cinder start

TOPS LEFT AMONG THE TREES IN LOGGING. THESE FEED THE FOREST FIRES SO EFFECTIVELY THAT THEY SOME TIMES DESTROY EVERYTHING IN THEIR PATH.

a little fire and have not jumped on it.

And then again it may be a foreman who is taking chances in order to increase his output. If the men know, and have it proved to them if necessary, that the owner will not have a man on the works who is taking chances with fire, it will make them more careful.

Right often a foreman thinks he must get logs out no matter what happens, and sometimes the logging superintendent is responsible for this. Every one concerned should understand that the one exception to this rule is a fire.

CAMP RULES.

Camp rules serve two purposes. One is to instruct the men what to do if a fire gets out, and the other what to do to prevent fires. Probably the rules which are very simple and very brief get the best results.

Two sets of rules, one for general use and the other for engines, might be used to advantage. The former would apply to fire-fighting, and the latter to fire protection.

1. When you see a fire put it out.
2. If you can't put it out tell the hook tender or foreman.
3. Don't lose any time.
4. Five short blasts of the whistle mean there is a fire.
5. That means every man in camp is wanted excepting the cook and flunkies.
6. Contract men—fallers and buckers—must fight fire.
7. John Jones is a fire warden and in charge of fire fighting in this camp. Do what he tells you.

ENGINE RULES.

The following could be posted on the engine:

1. If a fire gets out from this engine, put it out.
2. If you cannot put it out blow five short blasts on your whistle.
3. This engine must be equipped with a spark arrester, 100 feet of hose, 6 shovels and 6 5-gallon pails.
4. If it is not thus equipped, tell the foreman.
5. After it is equipped, keep it supplied.
6. Don't punch holes in the screen.
7. Wet down around your engine before going off shift and at noon.
8. John Jones is a fire warden and in charge of fire protection in this camp. Do what he tells you.

ORGANIZATION.

In large operations where there are many camps, the man in charge of fire protection would probably find it advantageous to have a man in each camp, or certainly in the camps where the greatest danger exists, to see that the engines are properly equipped, to keep them supplied, to watch out for fire and to take charge of fire fighting should a fire get out.

The authority of the man in charge of the fire situation, his relation to the foreman, and also the relation of the foreman to the camp fire warden should be thoroughly understood. Confusion in this connection might result in delay, and delay often results in a serious fire and considerable loss.

After the need for fire protection is realized, and the equipment for adequate protection is installed, the most serious aspect of the fire situation, as I see it, is the mental attitude of the loggers. They accept fires as a matter of course. Sometimes they are glad to have a fire, for it clears out the brush and makes a better chance. Last summer the C. A. Smith interests had about six million feet of logs burned over in a logging camp. After it was all over I said to one of the loggers, "That was pretty bad," and he replied, "Yes, but look at the logging now!" It is this spirit which contributes very largely to the fire risk. Part of it is due to indifference and part because it is believed that fires can not be put out, and that when they start the best thing to do is to get them burned out as quickly as possible so that logging can be resumed.

Of course there is no reason to have fires just because we have had them in the past. The loggers have separate bunks, and shower baths now, but a few years ago they lived under very different conditions. And the fire situation can be just as much improved as the living conditions.

When a logger brings up the argument that fires can not be kept out, and clinches it by saying that fires have always occurred during the dry season, I am reminded sometimes in my efforts to prove that they can be prevented to a considerable extent, of the attitude of the farmer at the circus.

This farmer, as you may recall, paid his gate money and went into the circus tent. But he never saw the show, for he spent all his time before the giraffe. And he walked around and around the cage and never took his eyes off the animal. Finally the show was over, and they put him out. But as he went he took one last look and said: "Huh, there ain't no sich animal." Now that man was set in his ways. So are some loggers.

The improvement along this line—that is, changing the attitude of the loggers—must come through education, of course. The best way to educate is by demonstration. Therefore when a fire occurs it is a fine example to show the men that it can be put out. Many of them have believed for years that when a fire does start it must burn itself out. The way to prove the contrary is to put out a fire after it has obtained a good start.

No man can really want to fight fire, for it is the hardest possible work. So if the men understand that it is a sure fight if a fire does get out, they will be apt to be more careful about protection.

They will take a personal interest in keeping the engines properly equipped, and in jumping on a small fire should one get out. And when this is done a long step will be taken towards efficient fire protection.

Time and patience—lots of both—are necessary to accomplish this. Then through better equipment, better organization, better understanding, and a better spirit, the more important points of fire protection will have been covered. But when this has all been accomplished, the most important thing of all will still remain to be done. That is to keep everlastingly at the men in order to keep them up to the mark, so that when a fire does get out they will jump on it so hard and quick that there will be no need of any further action.

*Address at the meeting of the Western Forestry and Conservation Association at Seattle, December 3, 1912.

TIMBER SALE POLICY OF THE FOREST SERVICE

CHIEF FORESTER GRAVES, in his annual report for 1912, recently issued, tells of the beneficial results of the present policy of making timber sales on the national forests. He says in part:

"The national forests contain nearly 600,000,000,000 feet of merchantable timber. Nearly 350,000,000,000 feet is ripe for the ax and deteriorating in value, rapidly on areas swept by fire, gradually on areas where the forest is mature and the trees are slowly yielding to decay. Standing timber, unlike coal deposits, can not be held in storage indefinitely. To the extent to which the overripe timber on the national forests can not be cut and used while merchantable public property is wasted. It has already been pointed out that the annual growth of wood on the national forests is equivalent to over 6,000,000,000 feet of lumber. This much can be cut every year for all time without depleting the supply. To utilize the rapidly deteriorating material and to aid in making the forests self-supporting the actual cut will be increased to approximately 3,000,000,000 feet annually as soon as possible. The conservativeness of this policy is evident when it is considered that there will be cut each year but 50 per cent of the annual growth on the forests, and less than 1 per cent of their total stand of mature timber. Notwithstanding the increased cut contemplated, this policy will reserve large amounts of timber for use during the period when the effects of the timber shortage are beginning to be felt.

"To put the national forests to use, their ripe timber must be sold under

conditions practicable for the lumbering operator. Under the policy in effect until last year of refusing to dispose of more than approximately 100,000,000 feet in one sale or to allow a period for cutting of more than five years, the annual sales of timber have always been less than 1,000,000,000 feet. A large percentage of the mature national forest timber is comparatively inaccessible, and, although it occurs in large bodies, heavy investments are required for the development of the transportation facilities necessary for its removal. In two particular cases this investment was estimated at more than $1,500,000. A change in policy to permit the sale of larger amounts of timber with longer periods for cutting was mentioned in last year's report. This change has been well received by purchasers and has increased the demand for timber. Instead of an arbitrary limit the amount which will be included in any sale is now determined by the actual physical conditions met in logging and the amount of capital which must be invested. Enough timber is included in each sale to justify reasonable men in making the investment necessary for its exploitation. The investment required is estimated by forest officers. More than sufficient timber to justify the outlay which the physical factors necessitate is not sold.

"Large sales are made only where they furnish the sole means of utilizing inaccessible timber. The experience of seven years has shown that much timber can be disposed of in no other way. The refusal to make such sales would result in great loss of timber, which is already deteriorating. Each sale made under such conditions not only prevents waste, but makes productive an area where now growth is offset by decay. The construction of transportation facilities in connection with every large sale develops and increases the value of other bodies of timber. In a recent case in California the increase in the value of timber not sold was estimated to be considerably more than the purchase price of the timber placed under contract. With the use of a railroad or other improvements granted to subsequent purchasers, the public will secure greater returns from adjacent bodies than it could have obtained had the first sale not been made. Finally, every sale of this character opens to general development a region previously locked up; it makes possible new mining operations, aids agricultural development by affording an outlet for crops, creates local business, and draws in population.

"The annual yield, or amount of timber produced annually upon any area, must be the ultimate basis of the cut. It is absolutely necessary that provision be first made on each market unit for meeting local needs. Enough timber for such needs, if it is available, is reserved. The following examples illustrate the application of this policy:

"Upon the Deerlodge National Forest, in Montana, the annual yield is estimated to be 40,000,000 board feet, all of which is needed to supply the mines at Butte. From this forest no sales to supply any outside markets will be considered. Upon the Holy Cross National Forest, in Colorado, the annual yield is estimated to be 6,000,000 feet, and since it is believed that local markets will require all or practically all of this amount, sales for the general market are not made. The limitation of cut on the Sioux Forest is 4,650,000 feet. Experience has shown that approximately 4,150,000 feet annually, practically all of the timber which can be cut, will be used locally.

"On many forests, however, the excess of production over the amount needed for local consumption is very great. On the Cascade National Forest, in Oregon, the annual production is estimated to be 200,000,000 feet, while present local needs can be supplied by approximately 1,000,000 feet. Local consumption on the Sierra National Forest is less than 700,000 feet annually, while the cut allowed is 260,000,000 feet. From such forests a large cut for the general market can safely be permitted.

"A cut in excess of the yield will be authorized in a few divisions or forests which have a large amount of mature and overmature timber and a strong demand, and on which restrictions to provide for a sustained local supply are not needed.

WORK OF THE WESTERN FORESTRY AND CONSERVATION ASSOCIATION*

By E. T. ALLEN, *Forester*

WHEN the Western Conservation and Forestry Association was organized three years ago, its three primary objects were to act as a clearing house for fire fighting and forestry methods for the existing Idaho and Washington patrol associations, to engage in publicity work to help these associations, and to encourage the forming of new associations in neighboring states which should both protect more territory and join us in the two preceding activities. We hoped to get more solidarity and co-operation for forest protection and management within the Pacific Coast timber industry itself, but had few ideas beyond this.

But incidentally we started a movement of far greater significance which, although not foreseen because it had no precedent, now shows to have been a wholly logical development. When practical men, representing varied conditions and free to experiment in ways forbidden by red tape or the petty economies of public appropriations, began to get together to perfect the organization of patrol systems, selection of wardens, fire-fighting methods, and field equipment, state and federal officials became greatly interested and joined in the conferences.

We soon found they had much to teach us also. Both found that, once we understood each other's problems and sincerity, we could work together in the field with greatly increased efficiency. Our modern publicity methods were already advertising both the evil of forest fires and our earnest effort to combat it, thus reducing carelessness and obtaining credit for our industry. It was another step forward when we could show that private and official co-operation was giving the community's resources better protection, as well as providing a safeguard against selfish conduct by lumbermen or political domination of official conduct. In short, we had hit upon a medium for helping not only each other, but the public; strengthening both with the public as well as removing any suspicion or friction among ourselves.

Year by year this triple alliance of private, state and federal agencies has grown stronger, both in conference and field, with increasing public confidence, until any measure we endorse is regarded as practical, fair and sound, representing joint experience and endeavor. Our meetings that began with a few of us around President Flewelling's desk now require a hall that will hold representatives of every forest interest in the West, from two nations, and their printed proceedings serve as a manual wherever forest protection is studied on this continent.

The privately-managed organizations allied with the Western Forestry and Conservation Association patrolled this year approximately 20 million acres, containing fully 500 billion feet of timber. This means that they protected just about a fifth of the nation's entire supply.

It was not a bad fire year. There is less opportunity to boast of spectacular expenditures and results. But organized fire work is like block signals on railroads; its efficiency is measured by its sureness of operation, whether emergency comes or not, and it is hard to say to what extent luck or preparation averts disaster. Experts know there was great improvement in fire organization this year. We could have met a severe test better than ever before. Some new experiments proved this absolutely, others are debatable. Next year may tax us to the utmost, so this meeting should sift these things out.

Probably the most important developments are in private and official co-

operation in actual syndicate patrol, systematizing of slash disposal, and growth of railroad interest. I wish to emphasize the former. All five states, except perhaps California, have done much this year to reduce the twilight zones where neutral territory was neglected, responsibility was hard to fix, expenditure was hard to divide if assumed by one, or where there was duplicate effort or conflict of authority. The leaders in all three agencies conferred to divide territory, agree upon men, exchange authority, fix financial responsibility, and generally arrange for increased efficiency at less cost to all. The Weeks law, allowing federal funds to states that will meet them, was immensely effective in cementing this alliance and for this reason is one of the most valuable pieces of recent forest legislation. We should make every effort for the continuance of this fund, which is nearly exhausted.

PUBLICITY WORK.

About 800 newspapers, from Montana to northern California, received our fire bulletins throughout the season. These are compiled from information sent in simultaneously by all the organizations in our territory, private and official. They are written in newspaper style so as to require no editing and bear release dates so every paper knows it is not printing matter already used. Their reliable up-to-date news, obtainable from no other source, make them widely printed, while enabling us to work in topical precautions to the public, counteract sensational misleading fire stories from other sources, and keep our own fire work well advertised. Occasionally we accompany them by editorials or verse on forest subjects.

This year's circular work was confined chiefly to the "Keep Them Green" pamphlet for general distribution and the "Ambitious Tree" story for public schools. Over 30,000 of the first were distributed by fire wardens, mailing lists, business houses, county officials, ministers, hotel folder racks, dropping them in rural mail boxes, and other devices. The Forest Service put out another 6,000. The "Ambitious Tree" was first printed in state Arbor Day bulletins and teachers' journals for reading to the pupils. We sent out 200,000 more to schools in wooded regions, with instructions from State superintendents to the teachers to have children take them home to their parents. Such work we can do immensely cheaper than local agencies, through the saving on large quantities, but we are limited in its extent by lack of funds.

We issue 100,000 of the "You Share It" gummed stickers for use on envelopes, signs, posts and walls.

An experiment with 6,000 colored pictorial posters, instead of the old-fashioned text fire warning, was not wholly successful because of the printer's mistake in colors, but we can apply the idea to better advantage next year. They are cheap in large numbers.

Our book, "Practical Forestry in the Pacific Northwest," continues in demand, widely advertising the northwestern lumberman's progressiveness and putting his problems before an influential class. It is much used in forest schools and libraries. The New York State Library Purchase Bulletin, the standard guide used by all American libraries, lists it among the 1,300 best books out of 11,000 printed last year. Some railroads have put it in their observation cars.

We make a strong point of preparing material for use by other agancies without expense to us. This year every important railroad on the Coast printed fire warning material in summer time-folders. Most telephone directories contained it, together with an offer of help by exchange operators in seeing that reports of fires reach the proper fire officer. Several associations carried the idea further by furnishing their wardens printed address cards to post near suitable phones. Our circular suggestion of cards in smoking cars, cautioning against throwing burning matches or tobacco from trains, was adopted to some extent. Where such suggestions need local dress, we pass them through our constituent associations and public forest officials. Among such are catchy fire warnings, mottoes for checks and stationery, special folders to be handed garage and livery patrons, game and fire law cards to be given sportsmen by

gun stores and license officials, material to go on guide maps, mottoes for cross-road guide boards, etc.

Public talking is more effective than we are apt to think, because printed accounts and proceedings carry the talks and resolutions far beyond the audiences present and because recognition on the program often advertises our creditable reputation. We prefer audiences unfamiliar with forestry and lumbering problems, therefore needing education, like Chautauquas, granges, clubs and conventions; unless on the other hand, like forestry conventions, they need guiding in specific matters. During the year I have talked at a great many such meetings in all our five States except Montana and as far east as Indiana. An equally important function is furnishing information for speakers, writers, committees and official boards having to deal with forest subjects and who call on us as authority. You would be surprised to know how much such stuff appears just as we prepare it and the work of research and writing it entails.

ASSISTANCE TO CONSTITUENTS.

We have been able to act for the local organizations in many matters hard to classify. It is a task to get up these meetings. During the season in which no meetings are held, we collect and exchange ideas, news and court decisions from all three agencies concerning protective methods, publicity and law enforcement. We have taken up with bond and investment houses the bad effect of depreciating fire hazard and secured from the most influential active help in getting their clients to support patrol. We are now arranging with the Post Office Department to place fire warnings for which we submit copy in all forest post offices and over the Postmaster General's endorsement. We have made expert reports on forest legislation and taxation questions to committees interested in such matters in several States. We have assisted in forming several new associations.

FUTURE PLANS.

While the foregoing report does not cover all the year's activities, it indicates generally how our money was spent. It is more important to discuss future projects. It seems to me the general publicity policy should be continued, putting old devices in new dress and introducing many we have never employed. This is almost wholly a question of money.

An idea worth considering is acting as the country's experiment station to test ideas and equipment in fire work. It would certainly be strong advertising and might be very useful directly. We are all interested in the possibilities of special telephones, wireless, spark arresters, tools and equipment, brush disposal methods, etc., that none of us can afford to try out because of enforced economy or fear of appearing impractical. By co-operating with selected constituents to get the field work done, but distributing the cost and taking the responsibility purely as experiment, the association might put everyone years ahead in the good ideas and save loss with the bad ones.

A legislative season is at hand. Without interfering in local affairs in any way to embarrass our constituents, the association should be able to assist them to the utmost. To do this requires not only the general material we are best able to collect, but all possible knowledge of each local situation and the steps being taken to meet it, in order that this also may be passed on if of service elsewhere. I feel strongly that those who can post us on such matters should do so fully and promptly. Moreover, forest legislation is of more than local effect and should have all the concerted effort consistent with varying local conditions.

A danger in association work, as well as in individual business, is continuing undue attention to matters important when first undertaken, but now so well in hand that they are less urgent than things we then neglected. Our fire association found organization the most urgent first problem. After solving this human problem they were slower to perfect in equal detail the mechanical facilities of communication and equipment necessary to secure highest effi-

ciency with least man power. Similarly, many branches of effort we allied to work out centrally are no less important than at first, but are so well systematized that we can devote attention to others. If any topics discussed at this meeting suggest useful association work, we should perfect our systems, central and local, to handle it properly.

A word more on co-operation as a principle. If our movement has been valuable in bringing about friendly relations between all elements involved, in actual accomplishment of practical things, and in building a latent strength we may sometime need more than we have needed it yet; it is illogical not to apply it as continually as possible in every-day business. There should be systematic, rather than accidental, conference between private and official authorities to arrange co-operative and overlapping patrol agreements, appointment of Weeks law men, division of fire costs, etc. It should be a rule that every interesting step or suggestion by any of us is synopsized and sent in at once for transmission to the others, instead of left for them to find out after the season is over. Our constituents should study ways to utilize the central facilities more frequently in local matters and should call upon us. In no other way can we do most for the money. We cannot discern local opportunities by clairvoyance.

Associations modeled after ours are growing up in the Lake States, in New England, even in Quebec. I met their leaders at the recent Conservation Congress and find that, while they have not gone as far as we have in working with official protective agencies, they are very progressive in their own fire work. We hope to keep in more regular touch with them. At the Conservation Congress Chief Forester Graves, Capt. J. B. White, the well-known Kansas City lumberman, and myself were constituted a committee to represent the working forest protectionists, public and private, in conferring with the American Forestry Association and the next congress to secure adequate and proper recognition of forest problems in their meetings and publicity. We hope our beginning acquaintance with British Columbia will grow into systematic relations of mutual benefit.

It all sums up to this. We have a framework and a good will on all sides that have united every interest in this room for more efficient work. We have proved the advantage of co-operation in everything to which we have applied it. Consequently it is logical to extend it, perfect it, and apply it more. But as we are an aggregation of units, success in this depends mainly on the active support, help, and suggestion of each unit.

*Address at meeting of Western Forestry and Conservation Association at Seattle, December 2, 1912.

YALE FOREST SCHOOL NEWS.

The first issue of the Yale Forest School News has been received. It is of eight pages, brim full of matter not only interesting to all the graduates and students of the Yale Forest School but to everyone interested in forestry. It contains articles by W. B. Greeley, '04, the editor; H. H. Chapman, '04, editor of the Alumni Notes; Director J. W. Toumey; Prof. R. C. Hawley, '04; Theodore S. Woolsey, Jr., '03; A. B. Recknagel, '06; R. B. Maxwell, '13; C. S. Martin, '07; A. K. Chittenden, '02; H. R. MacMillan, '08; D. P. Tierney, '08, and Louis S. Murphy, '07. It is to be published quarterly and should be in great demand.

A YEAR'S GOOD WORK.

The Pennsylvania Department of Forestry has now 974,891 acres of land in reserves, of which 8,595 acres were purchased in 1912, and the important work of administering them has been advanced as far as possible. Parts have been thinned out, the weed trees removed, roads either reopened or built, fire lanes made, and most important additional acreage planted with young trees. 1,924,829 seedlings were set out during the year on 963 acres, bringing the total up to 2,800 acres. As several hundred thousand acres of the State reserves must be replanted, the sooner this is done the quicker will the Commonwealth reap the benefits of its investment.

WIRELESS IN FIRE PROTECTION*

By C. B. Cooper, *Asst. Supt. Marconi Co., Seattle, Wash.*

I DESIRE simply to show the feasibility of wireless communication in forest fire protection work by showing possible simple construction of the apparatus, plan of use, and approximate first cost of apparatus. You are the pioneers in building trails and equipment for preservation of our forests, so is wireless the big pioneer who has built the new trail and equipment for preservation of life and property at sea, and there is no reason why it cannot join with you in the forests.

You now have and are installing telephone lines. Roughly speaking, the telephone line costs about $35.00 per mile to string on trees, which means an exceedingly fine means of communication, provided the line stays up, and you know from actual experience the troubles that ensue in keeping this line in repair. Then in an emergency you can lay your telephone wires along the ground, but the work entailed is very great, and, in case the fire is extensive, it is considerable time before you can connect the various fighting forces with your base of supplies or with the foreman in charge of the work.

However, there is no use in my going extensively into this, because you know the inefficiency or limitations of the service from actual experience better than I can possibly know. There is no forestry wireless service at present in America that we can point to as an example showing where it has done the work. Therefore, first, we must understand that the whole idea of wireless in the forests is purely experimental. It is working now over and through the forests on the Pacific Coast, but it is not working in them; therefore, I cannot state positively whether wireless will correct your troubles with the telephone system and give you the ideal communication so much needed, but I think it will work, and so does the company with which I am connected.

In designing and building a wireless outfit for your work the first thing to be considered is that it should be so designed as to permit of its being packed on mule back, as the localities at which the equipment will be found necessary are inaccessible in most cases by any other method of transportation. The average mule pack weighs about ninety pounds on each side of the saddle, and the usual width of a pack is about forty-four to forty-six inches; therefore, it would be necessary to build a wireless outfit in units to conform to these specifications. The maximum distance at which it would be necessary to establish communication would be about one hundred miles; therefore, the apparatus must be built powerful enough to cover this distance. And such an apparatus, namely, one built in units weighing about ninety pounds, so as to permit of its being carried by mule pack and one capable of transmitting one hundred miles, could be designed and built for about $1,600, exclusive of mast equipment. The mast equipment would, of course, mean trees as high as you could get them standing, and if in the exact locality at which this apparatus is to be set up there were no tall trees, then it would be an easy matter to build on to what trees were handy by splicing on an extension similar to a ship's mast.

The idea is that two of these equipments should first be installed as an experiment at a distance of about one hundred miles apart, and, of course, at points between which there is now trouble in keeping telephone communication, or where it is essential that communication be established.

And right here let me explain that one of the most essential features in good long-distance wireless work is that you have trees or masts as high as practical, so that you can raise your wires well up in the air, and the trees or

masts should be from 200 to 300 feet apart, especially for this hundred-mile class of station which I have mentioned, so that you can get a good, long spread of aerial wire. This aerial is part of the wireless equipment and consists of two wooden spreaders about ten feet long, and attached to this is the aerial, which consists of from four to six wires. These spreaders need not be carried in the pack, but can be picked up when needed, as any light 10-foot stick would answer.

After these stations have been proven successful, and I am sure they can be made to prove so, you would then have the data as to the exact requirements of the service and could undoubtedly then be able to reduce the cost of construction very materially, and especially so as these outfits that we now speak about are designed to work one hundred miles. There is undoubtedly a lot of the service which you would wish the wireless to perform that could be done with much smaller apparatus, as distances in this other service would probably average not more than about twenty-five miles.

After the equipment is installed you would require a competent operator at each of these one-hundred-mile stations. Such a man can be procured for about $75 per month and board. Then you would want to have these operators instruct such patrolmen as you designated sufficiently well in the telegraph code and the use of the apparatus, so that they could communicate or report in, as I understand they now do by telephone, once a day or as often as required. At first you could only use simple calls for each man, so that when he reported in he would only have to use his call. It would only take three or four days for a man to become familiar enough with the code to do this, and in about a month, by practising, they would become proficient enough to send in other matter, and in about six months they would be fairly capable operators. It would only be a question of time before the knowledge of operating would be none of the requirements of a patrolman's examination. You would, of course, plan to start this training of your patrolmen as soon as practical after the installation of the two sets, so that these men would be prepared to handle other outfits of the size necessary for one-hundred-mile working, or smaller outfits as the service may then show necessary.

The power to operate the larger equipment should be an engine of the motorcycle type directly connected to an alternating current generator and exciter. These engines would weigh about 75 pounds, and the consumption of gasoline would be very small, because power is only used for sending messages, and not for receiving, and the engine would only be run when actually necessary for reporting, and by proper economy a gallon of gasoline would probably last for ordinary use for some days. Then for the smaller outfits this type of engine could be used, or you could possibly use storage batteries. There is now in service on ships storage battery outfits as auxiliaries that meet the requirements of the U. S. Government to work one hundred miles, and where they are used on ships where a large spread of aerials can be gotten, these outfits have worked over two hundred miles day and night, so that you see it certainly seems feasible that storage battery outfits can be built to cover twenty-five miles, or probably more, because trees should always be found available from which an aerial could be strung to good advantage, and by adding more powerful batteries, the extra resistance that the woods would offer to the impulses and the less distance required, would just about minimize the two workings, as an example of the feasibility of battery outfits. These storage battery outfits could be condensed so that they could be carried over a saddle.

There is no use in my wasting much time in talking about the difference in cost between telephone and wireless. That you can see for yourself, as right now as a first experiment it is estimated that a one-hundred-mile equipment—that is, two stations that can be packed to any part of the bush you wish, whenever you wish—would cost about $3,200, while the low estimate of $35 per mile for telephone would bring the

cost of one-hundred-mile working up to $3,500, and it means that when service is once established by wireless between any two points it is always established. We have stations that have been in operation for years without being out of commission at any one time for more than an hour. And further, one hundred miles of communication by telephone gives you communication simply in a direct line, or, rather, simply along the line of telephone, and you have telephone stations installed at various points along that line. You would duplicate this idea by leaving aerial wires installed at various points along the line, so that the patrolman would simply have to hook onto these with his portable outfit in order to establish communication with the larger sets. Then, and here is a big item as I see it, this one-hundred-mile working in wireless is one hundred miles in every direction, so that in case of fire off the beaten trail it would not be necessary for a man to go back to the telephone line in order to make a report, but he would set up his apparatus just wherever he happened to be in that one-hundred-mile radius, ask for help, supplies or whatever was needed, and stay right on the spot doing what he could to get the fire put out, without losing any time at all. The question arises here as to just how powerful an apparatus it will be necessary for a ranger to carry with him in order to perform a service like this, but that of course is a matter of detail which would have to be worked out from the experience gained in the building of the two one-hundred-mile stations, and there is no doubt that either a battery outfit or a motor outfit can be so designed that it will be perfectly practical for it to be transported for this service.

Just yesterday I was talking with a gentleman who described a fire in Oregon to which he was sent last year. He said the fire extended over a section of about five or six miles in extent. His special duty was to lay the telephone wires in order to get connection with the base of supplies, and from the foreman in charge, to the various gangs around the fire. It took exactly three days to get communication, and in that time there was absolutely no way, except by messenger, to find out what the various gangs were doing, what supplies they needed, food, etc., and several men were used as messengers. With portable wireless outfits they would have had communication continually, and they could have been installed in practically no time, and small battery outfits would have answered this purpose perfectly.

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*Paper read at Western Conservation and Forestry Association meeting at Seattle on Dec. 3.

MONEY FOR ARIZONA FOREST RESERVES.

A total of $24,645.77 is to be spent by the Government on roads through the forest reserves of Arizona, according to official advices received from the Tucson (Ariz.) office of the United States Forest Service. This sum is Arizona's portion of the 10 per cent item in the recent appropriation bill passed by Congress for the purpose of constructing roads through the forest reserves.

TO CLASSIFY 150,000 ACRES.

It has been decided by the Forest Service to classify for agricultural purposes about 150,000 acres of the Angeles National Forest in the El Cajon and Tejunga districts of California. The work will be begun about January 1.

It has been estimated that it will require at least ten years to classify the forest lands in California, which cover 1,250,000 acres. The El Cajon district covers all the country north of Redlands and San Bernardino, extending north to the desert and as far east as the headwaters of Lytle Creek. The Tejunga project embraces the country as far east as San Gabriel Canyon and the territory north of Pasadena, Sierra Madre and Monrovia.

TELEPHONES FOR FIRE PROTECTION*

By Carl Bush, *Western Electric Co.*

During the past year there have been no particularly striking developments in the construction of telephone lines or apparatus for fire service. There have, however, been numerous refinements of apparatus and methods.

The most noticeable tendency in apparatus construction has been to substitute for the old wooden sets, wherever possible, weather and bullet-proof metal sets such as those exhibited here today, which in actual service have proven entirely satisfactory. The added security they give to the service has been very marked and we believe warrants the additional cost. As explained last year, there is no radical difference between the apparatus used in the metal sets from that used in the standard wooden sets of the same general character, the chief difference being in the method of housing the equipment and in the special protection to prevent condensed moisture inside the set, or what little moisture may be driven into it from the outside when it is in use, from injuring the apparatus.

In all cases, telephone equipment, whether mounted in a wooden cabinet or the metal case, should have three essential features looked after carefully:

First: There should be sufficient power in the generating mechanism to ring the various bells or other signals placed along the line. This generator should be compact, built to run as easily and smoothly as possible in order to make it easily possible to give clear, distinct signals on the line, and should be of such mechanical construction that the use of it will not appreciably wear the bearings within a reasonable time.

When, as in metal sets, protection from weather is sought, all metal parts should be galvanized or nickel plated excepting where brass or copper is used, to prevent rusting. All windings should be thoroughly impregnated with a moisture-proof compound to prevent moisture entering the windings and short circuiting them. Contact terminals should be painted with a satisfactory weather-proof paint and possibly the use of beeswax might be considered necessary also to assist in taking care of moisture condensing from the air enclosed within the set under various changes of temperature.

Second: A signal bell, where such is needed, should be looked after carefully to see that it is sufficiently sensitive to give a maximum sound with the minimum of current furnished by the generators along the line. In most cases, your telephones are called upon to give extremely hard service under conditions varying from first-class lines to the poorest type of construction. Under these circumstances you cannot look after your signalling equipment too carefully. Like the generator equipment, the ringer should be protected from moisture in every possible way and along the same general lines.

Third: While we ordinarily consider talking equipment to be first in every essential in connection with telephone apparatus, yet in forest work it is not of first importance, for without signalling apparatus which is entirely satisfactory in every respect, there will be no possibility of using the talking equipment. Of second importance, however, the talking equipment is practically on a par with the ringing equipment, because if the talking apparatus is not satisfactory in every respect, after the party has been signalled, no conversation can be had. The talking service must be clear and distinct in order to carry on conversations in a satisfactory manner.

I should like to say a few words with reference to portable equipment, as this also constitutes a very important part of any modern forest telephone system.

The essentials of portable telephone apparatus are very similar to those of permanent equipment, but it is necessary to economize in space and weight in every possible way. It should be definitely understood that the greater part of the weight of the portable telephone set is contained in the magneto or generator which furnishes the signalling current to ring the various bells or signals along the line. As the output or power to be obttained from one of these generators is dependent first upon the speed at which the generator can be driven, and second the amount of active metal which is used, it can readily be seen that in order to get a light-weight equipment we must drive our generator at an extremely high speed or else the weight of the active metal used in the construction of the equipment will be too great.

There are mechanical limits to the speed at which a generator can be turned and also an electrical limit. It is generally unsatisfactory for the usual telephone circuits to use current changing polarity, or in other words, alternating at any frequency greater than 16 2-3 times per second. The average generator driven at 900 revolutions per minute, gives this alternation. With the limit set on the speed in this way, the next step is to reduce the weight of the necessary metal used in the generator, to the lowest possible amount.

We have evolved a special light-weight portable set, which has been designed primarily for use by the Government Forest Service, but which will be ready for the market this coming season and can be had by anyone on payment of the usual price. This equipment uses a special generator which has been particularly designed for this kind of work and embodies a number of new features, particularly in the kind of material used. While this generator is not sufficiently strong to ring every telephone on a 50-mile line where there are 15 or 20 sets on the line, it will in all cases ring the nearest telephone or a number of telephones, so that anyone equipped with this portable set can ring some telephone and have his call relayed along the line to the proper party. We recommend this type of set only for such places as an extremely light weight set is needed and recommend, wherever weight is not so great an object, our heavier set known as the No. 1330 type, which uses the same general equipment as that included in our standard five bar telephone set, and will do the same work in every way.

As practically all the telephone circuits in which you are interested, are one wire grounded lines, it is necessary, with the portable set, to provide a suitable grounding arrangement which may be carried with the set. We are exhibiting the equipment developed for the Forest Service for this purpose, which appears to us to be satisfactory in every way. We also exhibit some of the special portable copper wire developed for the forest service for use in emergencies, to be carried into the woods a reasonable distance from the main line.

There have been no material changes in line construction during the past year. In general we are still recommending No. 9 B. B. galvanized iron wire to be used for all circuits and, where the lines are to be built through the woods, the standard Forest Service split tree insulator which is known as our No. 37 and attached to the trees with a short piece of stranded wire, called by the manufacturers "Seizing Strand." This departure from the single strand wire, formerly used, resulted from the testimony by Mr. DuBois, of San Francisco, at last year's meeting, that the single strand wire often crystallized, allowing the line wire to go down. We believe this will not happen with the multiple strand just mentioned. In all other respects, we believe that the general construction followed by the Forest Service and recommended by us last year will be found entirely satisfactory.

*Address at meeting of Western Forestry and Conservation Association at Seattle, December 3, 1912.

SLASH DISPOSAL PROBLEMS*

By State Forester F. A. Elliott, *of Oregon*

THE slash burning question has been a live issue for the past few years and bids fair to increase in interest to the entire Northwest in proportion to the increase in logging, land clearing and allied industries. To say that slashings, or the debris left from logging, wood-cutting, land trails, telephone, telegraph and power transmission lines, creates a very grave menace to standing timber and other property in the community, is only reiterating what has been said from time to time by the different writers and speakers on the subject, and what is a generally conceded fact by all who have given the matter any serious thought. Volumes could be written verifying these conclusions, based upon the actual experiences of settlers who have lost their homes, loggers who have lost their equipment, timber owners who have lost their timber and cases where even the loss of life itself can be traced to careless handling and to the lack of a systematic disposal of slashings.

Up to this point there seems to be no difference of opinion, but when we come to consider laws governing the slash disposal question, methods to be used, time of year for burning, etc., then it is that we begin to flounder and sidestep the issue on account of the diversity of opinion in a given locality, and the almost innumerable local conditions governing individual cases.

In Western Oregon we have the heavily timbered fir, spruce and hemlock districts, where the refuse after logging very often looks as though everything has simply been cut down and jumbled together in an inextricable mass of logs, limbs, tops, brush, etc. Under such conditions, nothing but a wholesale burning would be practical or even possible. In Southern and Eastern Oregon we have the lighter stands of pine timber, where after logging it is very often impossible to get anything like a good burn without piling or wind-rowing the brush.

We have a clause in the Oregon Forestry law providing that "all persons, firms or corporations engaged in logging or permitting logging on their lands, shall each year burn their annual slashings at such time and in such manner and with such help as will confine the fire to their own lands, and if such burning is done between June 1 and October 1, shall cut down all dead trees or snags over 25 feet high." This same section of the law also covers in a like manner the inflammable debris resulting from building of trails, roads or railroads in the State; while another section covers old slashings, windfalls, etc., likely to cause the spread of fire.

Now, assuming that every one is interested in the protection of property from forest fires, the question is: Just how far is the State justified in carrying out the letter of this law? We have a great deal of old slashing that has been allowed to accumulate for a number of years before this law was passed. Since then, climatic conditions have been very unfavorable for annual slash burning at a time when fires could be controlled at a reasonable expense to the owner. Our new law is considered as being on trial, and therefore we have so far been somewhat lenient and have relied more on the co-operation of those interested than upon a strict enforcement of the law. Whether this course has been a wise one will be shown by future developments.

Under our forestry laws it is not practicable, and in fact not permissible, for the State to step in and burn a slashing unless the owner refuses, or persistently neglects to do so. We have therefore only assisted in this work by furnishing our supervising wardens, who are selected very largely for their efficiency in this work, to take charge of slash burning whenever requested.

These wardens are also instructed to insist on having slashings of all kinds burned whenever conditions are favorable, even though such burning was done during the closed season.

The Fall of 1911 was too wet to allow of any great amount of slash burning, and we made the mistake of urging slash burning last April and May before putting our supervising wardens in the field. The result was that burning of slashings, old fern and brush-covered burns was done by inexperienced men without sufficient help to control the fires. When the very unusual hot, dry, east winds came up in May, a number of fires were allowed to escape, causing crown fires at a time in the year heretofore thought impossible. As a result, timber men who formerly were strong advocates of either Spring or Fall burning, are now advocating neither. The extremely dry weather during April and May, accompanied with east winds, and the very favorable weather through the entire closed season, June 1 to October 1, it seems to me, only makes it the more evident that we must be ready to meet conditions as they come up instead of having set rules that may be found impracticable, dangerous or impossible when most needed.

Unless the State has a sufficient appropriation so that a trained crew of men can be kept employed by the year to do this work, I am more than ever convinced that local organizations of timber and other land owners, rather than State officers, should handle the slash burning. They have a much better chance to familiarize themselves with local conditions, and have or should have local men on the ground at all times of the year to take advantage of weather conditions. In the course of time they would be able to get together an expert crew of field men to handle this work more effectively, with less expense and less likelihood of damage being done to surrounding property, and surely with less friction than if handled by the State. In Oregon, for instance, we have only $30,000 per year for handling all phases of forestry, and it is needless to say that our funds are entirely inadequate to do the slash burning, and very meager for even supervising it with the most hearty support and co-operation of all concerned.

We have found that there are about as many different classes of slash as there are slashings to burn. They can, however, be classified under three general heads, as follows: (1) Slashings of the rancher in clearing his land; (2) the brush and tops remaining where the timber has been cut into cord wood; and (3) the debris left after logging.

The first class has probably given us the least trouble, since it usually consists of only a few acres with one or more sides bounded by cleared land, so that burning can be done when the wind is blowing toward this and away from the standing timber or brush land that might otherwise become ignited. Slashings of this character, when the work is done under the supervision of our wardens, are almost always burned without any extra expense to the owner other than the actual time spent in doing the work. If they are of such magnitude as to require assistance, this is usually furnished by neighbors who possibly have work of the same kind to do, and no actual outlay is necessary. A number of such slashings were burned the past year under the supervision of our wardens and at a minimum of expense, with no loss to property of any kind.

The second class (wood cutting) is always a hard proposition, as the wood is left on the land to be hauled out during the dryest part of the season, so that burning can't be done in the Spring of the year, and the wood is not removed in time to permit Fall burning. We are, moreover, at a great disadvantage in getting this class of burning done, in that it is the opinion of our attorney general that our law does not cover debris left after wood cutting, and therefore all we can do is to request such burning but cannot force it to be done. A 70-acre slash of this character was, however, burned last September by a crew of 15 men, while the wood was still piled on the land. This was done by first carefully burning around the wood piles and afterwards making a general firing. This work was done in about seven hours

on land that was covered with an exceptionally heavy slash, with no damage to the wood, and left the land practically clean, with no danger of fire the following season, and with very little expense to the owner or to the State. Another similar burning was done on an 80-acre tract during a damp time in the latter part of May, showing that such slashings can be gotten rid of if only the owners can be persuaded to do it in a systematic way.

The great bulk of our slashing, of course, comes under the head of debris left after logging, and we have some of these that are also covered by woodcutting, since frequently the owner wishes to make cord wood of the tops, etc., left after logging. Where this is the case we have made very little headway in getting at a solution of the slash removal, and I am of the opinion that our law will have to be changed to meet this condition before any great amount of such work can be done.

One of our supervising wardens, with the help of four men, burned a slashing of 320 acres in Western Oregon, on September 26 and 27. This was a very heavy slash, with green timber on the east and south, and logged over lands on the north and west. He first had all snags felled within 100 feet of the green timber, and burned this 100-foot strip against the wind; then on the second day, at 2 p. m., with a light breeze from the northwest, he set fire on the north and west sides, making a clean burn at a cost of 20 cents per acre and with no loss whatever.

Another warden in Eastern Oregon, with the assistance of three men, burned a heavy slashing on 80 acres that was bounded on three sides with timber and one side by a railroad. A fire line two rods wide on the sides next to the timber was first burned, and then the entire slash was fired against the wind. One man was kept on the fire line through the night to prevent any chance of fire backing into the timber. A good clean burn was obtained, and the cost was a little less than 25 cents per acre.

A warden in Southern Oregon, with the help of two men, burned a 125-acre slashing, with timber on one side and slashings containing logs on three sides. Fire was started along a narrow road between one of these slashings and the one to be burned, at 4 p. m., and a fire line burned some 50 feet wide. After this fire break was thoroughly burned, the main slash was fired against the wind and a clean burn made, with no damage, and at a cost of less than 15 cents per acre. The same warden burned 240 acres in the same manner, with the help of three men. This area was practically surrounded by timber, and a narrow strip was first burned around the slashing, which was afterwards fired from all sides. A good, clean burn was secured here at a cost of 20 cents per acre.

Another warden, with the help of ten men, made a very complete and successful burning of a slashing of nearly two sections of land located on steep mountain sides. Stubs were cut down over a strip four rods wide, and this strip was burned first. Then fire was set on the upper side and allowed to burn down the hills for some distance, then set on the lower side so that the fires came together at a good distance from the standing timber. All the fires were set in the afternoon after wind had died down, and no difficulty was experienced in controlling them. This burning was done at a cost of about 20 cents per acre.

As the State had but one man in each county, the greatest trouble we have found is in being able to give the necessary assistance just at the right time to be able to get rid of the slashings that should be burned after the first Fall rains. If the timber owners could see the necessity of keeping their patrolmen on duty at this time to assist the State, it would greatly facilitate matters and help in a work that, to my mind, is of the greatest importance, not only to the State but to all land owners and settlers in the timbered districts.

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*Address at meeting of Western Forestry and Conservation Association at Seattle, December 2, 1912.

THE ANNUAL MEETING

THE annual meeting of the American Forestry Association will be held in Washington, D. C., on Wednesday, January 8, at the Willard Hotel. A large attendance is expected, and as there are many important questions to be discussed, and most interesting reports to be heard, the members of the association are earnestly urged to be present.

The directors for 1912 will hold their final meeting at 10:30 in the morning.

At twelve o'clock noon there will be a general business meeting in the Red Room on the first floor of the hotel.

At one o'clock a luncheon will be served in the Red Room and tickets for this, which are $2 each, should be secured in advance from the secretary. Requests for reservations, and for parties who desire to be seated at the same table, should be made as far in advance as possible.

At three o'clock there will be a general meeting in the Red Room, at which a number of papers on questions of vital importance to the forest interests will be read and discussed.

At 8:30 in the evening there will be a smoker and men's meeting at Rauschers, corner of L Street and Connecticut Avenue.

It is expected that Secretary of the Interior Walter L. Fisher will make an address. Former Chief Forester Gifford Pinchot will attend and will address the members; and Charles Lathrop Pack, president of the National Conservation Congress, will speak. Papers are to be read during the various sessions by Chief Forester Henry S. Graves, Assistant Forester W. B. Greeley, Prof. H. H. Chapman of Yale, a member of the Pennsylvania Chestnut Blight Commission; L. F. Kneipp, R. Y. Stuart, and W. L. Hall of the Forest Service, and a number of others.

Members who expect to attend are requested to advise the secretary as soon as possible.

THE APPALACHIAN COMMISSION'S REPORT

THE report of the Appalachian Forestry Commission, sent to Congress in December, shows that the lands approved for purchase during the fiscal year ended June 30, last, mostly in the South, aggregated 255,822 acres. The opinion is expressed that it will probably be unnecessary for the Government to acquire more than 50 to 75 per cent of the purchase areas of some 6,000,000 acres. During the year the Geological Survey examined 2,536,845 acres in accordance with the law, and its reports were favorable to the acquisition of this land. In the South the reports were based upon damage caused by erosion, while in New England the report was based upon the effect of forest cover upon run off and stream flow.

Lands having an area of 2,102,330 acres have been offered to the Government within the purchase areas. The Forest Service during the year examined 665,891 acres. The report describes the lands selected for purchase in Georgia, Virginia, North Carolina, Tennessee and New Hampshire. Condemnation has been necessary in some few cases owing to cloudy titles. The lands have been surveyed by the Forest Service. The land practically acquired by the Government is classified as follows: Virgin timber land, 68,899 acres; timber land, 132,524 acres; land on which timber is reserved, 26,500 acres; abandoned farms, 2,533 acres; barren and non-merchantable land, 26,772. The average price is $5.95—the range being from $1.16 to $15 per acre.

WESTERN FORESTRY AND CONSERVATION MEETING

QUITE the most successful meeting of the Western Forestry and Conservation Association held since its organization was the one at Seattle, Wash., on December 2 and 3, when some two hundred lumbermen, timber land owners, state and national foresters, forestry educators, railroad men, and representatives of various forestry associations and fire protection organizations attended. Each of the two days was filled with work of eminently practical value, the papers and discussions on the different topics being based on the experiences, observations and study of the men delivering them, so that the facts, figures and general advice secured from them will be of material aid in furthering the work in fire protection, forestry instruction, forest legislation and publicity.

An excellently arranged program devoted to reviews of 1912 experiences of private owners and State and national foresters; the safeguarding of logging operations; methods of slash disposal; the co-operation of the railroads in fire prevention; methods of fire fighting and patrol; the use of men, tools and supplies in fire fighting; principles in framing, passing and enforcing forest laws; publicity for forest protection, etc., furnished opportunities for the reading of many carefully prepared papers and a general discussion of their salient features of very great value to all present.

Such a meeting will not only aid the members of the Western Forestry and Conservation Association in furthering the work which they have been so successfully doing for the past few years and from which they have derived such gratifying results, but it was also most beneficial to the many visitors and guests of the association who were favored by being able to attend.

President A. L. Flewelling in his opening address outlined the work of the Association. He said, in part:

"We have demonstrated in the past that forest fires are preventable and that with proper organization, small fires can be put out, and that nature provides the new growth without planting and matures it unaided if protected from fire; that we can't put out fires by talking, and that it takes money to hire fire-fighters and run an organization. We are no longer in the kindergarten, we are as thoroughly organized as a great army. We are not here to boast of our achievements, but to present you with an experience table which will demonstrate the facts, and which will carry conviction to the mind of every thinking man, that our work in forest protection is unsurpassed in the civilized world.

"To reach this state of satisfactory organization has required a vast amount of hard and unselfish work on the part of the officers and members of the districts and State organizations of which this great association is composed, and the expenditure of vast sums of money for rangers, for new equipment and supplies, but it has been worth the cost in money and effort and the foundation stones on which we have built our structure will endure.

"We have arrived largely through the application of common sense, to the situation. Prior to the formation of this association a condition had been brought about by the extreme and unpractical views of some radical timber owners on the one side, and the short-sighted, extreme and unwise views of the old-fashioned lumbermen had resulted in clouding the issue and had left both sides to the controversy fiddling while Rome was burning. Now each side has conceded a little, and it has been found they never were very far apart, a whole lot of theory has been eliminated, and common sense substituted in its place and all have been

brought to the realization that each particular district has its own specific conditions and that no hard-and-fast rule could be made practical in all the territory covered by this great organization. So it has been conceded that each State organization should look after its own legislation and each district organization look after its own methods of prevention and fire-fighting, each giving to the other the experience table of the past, so that whenever a good thing or a new method developed in one district if like conditions permitted, it could be utilized and adopted in other districts. Thus while our organization has great strength, it is flexible enough to accommodate itself to local conditions in each State and district as they actually exist.

"This organization gives the most practical demonstration of co-operation between the Federal Government, the State and the private owners of standing timber ever obtained. There is now such a unity of sentiment between all the parties at interest, that every subject or controversy can now be discussed and settled on broad lines, without any suspicion of bad faith on the part of any one, and all our contracts for joint patrol, telephone service and division of territory between the district organization and the Government and the States are being carried out without any friction."

Some of the other addresses will be found on other pages of this issue.

The resolutions recommended that an appropriation similar to that provided by the Weeks law for protection of watersheds of navigable streams be one of the regular appropriations of Congress; that study of forestry subjects be taken up in the public schools; that liberal appropriations be made by the legislatures of the Northwestern States for fire patrol purposes; that the legislatures of the Northwestern States take such steps as will insure the reforestation of areas of the cut-over and denuded lands best adapted to reforestation; that the government build wagon roads across national forests to connect with State roads when the State highway department of any State certifies that such a connecting road is a necessity.

The American Forestry Association was represented at the meeting by Mr. E. A. Sterling of Philadelphia, a director, and P. S. Ridsdale, of Washington, the executive secretary.

CANADIAN ASSOCIATION ACTIVE

THE Directors of the Canadian Forestry Association met in Ottawa on December 6 in order to present to the Dominion Government those resolutions passed at Victoria, B. C., in September, which bear upon federal government work. There was a good attendance of Directors and in the absence of the President, John Hendry of Vancouver, and the Vice President, Hon. W. A. Charlton of Toronto (who was prevented by his parliamentary duties), the chair was filled by Mr. Geo. Y. Chown of Kingston, Ontario, Past President.

Having arranged for the presentation of the case, the deputation met the Prime Minister, Rt. Hon. R. L. Borden, and Hon. W. J. Roche, Minister of the Interior, in the Prime Minister's office. The deputation was introduced by Mr. Chown, who also was the first speaker in presenting the resolutions. While all the resolutions were duly presented, attention was concentrated on those relating to the extension of civil service regulations to the outside forest service. It may be explained that three years ago that part of the civil service employed in the city of Ottawa was placed under civil service regulations, and that what is now desired is that these should be extended to take in that part of the service engaged outside of Ottawa in the field. Mr. Chown in his statement referred to the success which had attended the placing of the outside forest service of the United States under civil

service regulations, and urged that the same results would follow in Canada. Senator Bostock spoke as representing the Association in British Columbia, and Mr. Ellwood Wilson as coming from Quebec.

The Premier, who spoke for both Ministers, received the deputation most cordially, and assured them that the government was seized of the great importance both of the forests and of the need of a service of the highest efficiency. He read a brief memorandum prepared by the Minister of the Interior as to the extent and aims of the Dominion Forestry Branch, and concluded by saying that government was giving this whole matter very careful attention, and that he thought they would find that the seed which they had just planted had not fallen on stony places. The deputation retired feeling that they had had a very satisfactory interview.

COMING MEETINGS

Officials of forestry, lumber, timberland and fire protection associations are invited to send to AMERICAN FORESTRY notices of their meetings to be published in this column.

January 6-7—Meeting of Eastern Foresters' Association, at Lakewood, N. J.

January 7-8 — Northwestern Cedarmen's Association, Duluth, Minn. Annual meeting.

January 8—Annual Meeting, American

January 8-9—Retail Lumber Dealers' Association of Indiana, Claypool Hotel, Indianapolis, Ind. Twenty-ninth annual meeting. Forestry Association, at Washington, D. C.

January 8-9—Central Association Lumber and Sash and Door Salesmen, Claypool Hotel, Indianapolis, Ind. Annual meeting.

January 9-10—Conference of State Foresters under auspices of the Forest Service, at Washington, D. C.

January 13—Idaho Cedarmen's Association, Spokane, Wash.

January 14-16—Nebraska Lumber Dealers' Association, Rome Hotel, Omaha, Nebr. Annual meeting.

January 14-16 — Northwestern Lumbermen's Association, Minneapolis, Minn.

January 15—Third annual convention, North Carolina Forestry Association, at Raleigh, N. C.

January 16—Indiana Hardwood Lumbermen's Association, Indianapolis. Annual meeting.

January 17—Pacific Coast Shippers' Association, Seattle, Wash. Annual meeting.

January 18—Montana Retail Lumbermen's Association, Butte, Mont. Annual meeting.

January 21-23—Ninth annual convention American Wood Preservers Association, Hotel Sherman, Chicago.

January 21-23—Ohio Association of Retail Lumber Dealers, Cleveland, Ohio.

January 21-23—Union Association of Lumber and Sash and Door Salesmen, Cleveland, Ohio. Annual meeting.

January 21-23 — Colorado & Wyoming Lumber Dealers' Association, Denver, Colo. Annual meeting.

January 22-24 — Southwestern Lumbermen's Association, Kansas City, Mo. Annual meeting.

January 23-24—National Lumber Exporters' Association, Chattanooga, Tenn. Annual meeting.

January 23-24—Retail Lumber Dealers' Association of Pennsylvania, Schenley Hotel, Pittsburgh, Pa. Annual meeting.

January 28—Northern Pine Manufacturers' Association, Minneapolis, Minn. Annual meeting.

January 29-30—Retail Lumber Dealers' Association of the State of New York, Hotel Utica, Utica, N. Y. Annual meeting.

January 29-30—Pennsylvania Lumbermen's Association, Hotel Walton, Philadelphia, Pa. Annual meeting.

January 29-30—Retail Lumber Dealers' Association, Masonic Temple, Spokane, Wash.

January 31—West Coast Lumber Manufacturers' Association, Tacoma, Wash.

February 4—Canadian Lumbermen's Association, Ottawa, Ont. Annual meeting.

February 4-5—Hardwood Manufacturers' Association of the United States, Hotel Sinton, Cincinnati, Ohio.

February 5—Canadian Forestry Association, Ottawa, Ont. Annual business meeting.

February 11—Western Pine Manufacturers' Association, Spokane, Wash. Quarterly meeting.

February 11-12-13, 1913—Yellow Pine Manufacturers' Association, Grunewald Hotel, New Orleans, La.

February 11-13 — Illinois Lumber and Builders' Supply Dealers' Association, Hotel Sherman, Chicago, Ill. Annual meeting.

February 13-15—Western Retail Lumbermen's Association, Masonic Temple, Spokane, Wash. Annual meeting.

April 8-9-10—Lumbermen's Association of Texas, Beaumont, Tex. Twenty-seventh annual meeting.

EDITORIAL

The States Rights Movement.

SINCE its organization the American Forestry Association has stood for the development of national forests as the first and most important achievement in forestry in this country. The Association vigorously urged and was largely instrumental in securing the two laws upon which the present system of national forests is founded, namely, the law of 1891, giving the President power to proclaim national forest reserves, and the law of 1897, authorizing the Secretary of the Interior to administer these forests.

The increasing importance and usefulness of this national work in the West, and its assumption in the East under the Weeks law, has at all times received our recognition and support. We have seen the policies advocated by the Forest Service in the handling of timber, grazing, water power and lands, win their way to recognition in the face of bitter opposition, solely on their merits. Under national administration of the grazing privileges, stock wars have ceased, and the number of small owners of stock has increased tremendously. Lumbermen have found that they could do business with the Government, and of late have been willing to undertake contracts for twenty years. Settlers are given lands, but fraudulent claims are not permitted. It can now be stated with truth that the population directly dependent on and residing within or near these national forests is almost unanimous in its support of the present policy and ready to defend the Government against all attacks. The only local exceptions to this rule are found to be individuals who have been prevented from acquiring something to which they were not fairly entitled, such as a fraudulent mining claim or a timber homestead.

But this national policy is not without its enemies, and they are numerous and powerful. In almost every instance, the opponents of the Forest Service are found to be directly interested in some form of special privilege which would flourish with less interference should the strong hand of the nation be withdrawn. Cloaked under various disguises, one of which is the plea that agricultural lands are being deliberately withheld from deserving pioneers, these interests are endeavoring to secure:

1. Free and unregulated grazing, which would enable owners of large bands of sheep to monopolize the public range and drive out the small owner and cattleman.

2. Freedom from close inspection of mining claims, which would permit the patenting of wildcat mines or the acquiring of valuable timber under false pretenses.

3. Throwing open of large areas of land containing timber of immense value, in order that title may pass from the nation to individuals and thence to large lumber companies and corporations.

4. Removal of restrictions on cutting, so that full exploitation of the forests may take place immediately with no provision for securing reproduction and a future crop of timber.

5. Encouraging an influx of settlers upon lands regardless of their agricultural value, in order to boom communities for the benefit of railroads, real estate values and trade.

Attempts to break down the national forest administration and secure these objects have largely failed, due to the high standard of integrity and ability that has so far been maintained in the Forest Service from the chiefs down through the rank and file to rangers and forest guards.

Despairing in this effort, the political opponents of the national forest policy now advance the plea that these resources belong by right to the States and should speedily be turned over to them. No one need misunderstand this argument for an instant. It is urged with the hope that the States will prove less obdurate and will permit the exploitation of these national reserves in a manner more in keeping with the desires of the larger interests. To such a step, the American Forestry Association is unalterably opposed. Not a single valid argument can be cited in its favor. The nation interferes in no way with the rights of the States by retaining these resources. The States now receive 35% of the gross annual income, and bear no expense of administration. The nation can afford to expend money, and is incurring an annual expense, far in excess of its present revenue, to build up a system of trails, roads and telephones and to protect and develop these forests. This the States could not and would not do. The public has definite knowledge that the Forest Service is incorruptible. Are we sure that all States could be so trusted? Efficiency in handling the big problems involved is secured under the nation by the employment of experts and by civil service standards. Could the States duplicate this service?

The American Forestry Association takes its stand squarely on this issue. The national forests must remain the property of the whole people. And we are certain that once the public understands the meaning of this contemplated attack upon the Forest Service, there will be little chance of its successful consummation.

FOREST SERVICE UNJUSTLY CRITICISED.

THE Forest Service has recently been subjected to a great deal of altogether unjust criticism, at times bordering on abuse, by people interested in mining claims on the national forests. Some mining congresses have passed resolutions condemning the Service. Individuals have made the charge that improper restrictions to the mining development of claims on the National forests are made, and that the patenting of mining claims is hampered by officious employes of the Service.

The fact of the matter is that the Service is only doing its proper part in enforcing the law. The law provides that forest officers must examine and report to the Interior Department all claims for patents on the national forests. Claims on which the requirements of the mining laws are not observed naturally are not approved. If there is evidence of fraud on any claims or if the legally required development is not done, then an examination is made by a practical mining expert, and if warranted adverse recommendations are made. This is eminently fair and proper and instead of being condemned should be heartily approved by every fair-minded mining man.

The attitude of the Forest Service is clearly defined by Chief Forester Graves, who says:

"Mining claims are perfected and new mining claims initiated under the same laws which apply on the unreserved public domain, and no restriction of any kind is imposed on the prospector in his search for valuable minerals. He may go freely where he pleases and may stake out his claim wherever he finds indications that seem to him worth following up. If he desires to build a cabin on Government land not included within the limits of his claim, he is given a free occupancy permit and free timber for its construction. On his own claim he need only comply with the law to remain in undisturbed possession for as long a time as he may desire before making final proof. Both the timber and the forage on it are reserved for his use, in so far as he may need either in connection with the development of his claim; and if the supply on his own claim is not sufficient for his needs, free use of na-

tional forest timber, and of range for his work animals, may be had for the asking. When he desires to make final proof no requirements are imposed upon him other than those laid down by the general mining laws for all public lands. Moreover, by the protection which national forest administration affords against fire and by the provision made for permanence of timber supplies for local needs, he gains both in security against fire loss and in insurance against the danger of having to bring timber from distant markets at a heavy cost in order to work his mine."

LEGISLATION ON FOREST TAXATION.

ARE the lumberman and the land owner giving enough attention to the necessity of creating a just system of forest taxation? This year it will be considered by the legislatures of a number of States. During 1912 this subject has been under investigation by special commissions, or by the State Forester, in California, Connecticut, Maryland and Pennsylvania. Reports of these commissions are now to be acted upon. In two states, Massachusetts and New Hampshire, constitutional amendments were before the people last fall, providing among other things that legislation could be enacted on forest taxation.

Everyone who has studied present conditions of forest taxation knows that the general property tax can inflict a most unjust burden on the forest. Furthermore, this burden isn't a theoretical one only, but is being felt sharply wherever in present practice the assessed value of forest lands is being placed at the "actual and present value," the standard usually set by the law. The tendency of owners in the past has been to say: "Let well enough alone, the law is being enforced leniently and we don't expect to suffer." Persons making that very remark have in their next sentence shown its fallacy when they said "We won't buy any more land in ——— because they are putting their valuations so high," or, "We'll have to cut our timber in ——— because heavy taxes are eating up its value."

No dependency can be placed upon a continued lenient enforcement of the present general property tax on forests. More rigid and strict enforcement of the general property tax on forest land is being realized yearly, and none of the inequalities of assessment in different parts of a town (a township) or a county seem to be done away with. It is fully time that all the interests concerned should attack the problem and work out its solution. Investors in forest, whether natural or planted, are not crying for exemptions or special benefits. All that is desired is constancy and definiteness in valuation and assessment and that the business of forest growing bear no more than its fair share of the burden.

The lumbermen and land owners ought to take an active part in giving information before legislative committees, in conferring with state tax officials and state foresters on this question, especially through committees from various associations. The lumberman and the land owner are the ones to benefit or to be injured under any new system of taxation. Their active efforts will do more than anything else to inaugurate a practical system for permanent use.

There are many points to be considered in changing from our present system, two of which are especially important, (1) that the burden of taxation on forest growing be no heavier in proportion than that on other industries, but rather somewhat more lenient, and that it be made definite in order that investors may figure what amount taxes will require; (2) that the local revenue from taxation of forests shall not be suddenly diminished or cut off to the financial detriment of towns or counties. The system most favored thus far in the United States and in practice in other countries is an annual tax on the land alone and a tax on the timber when it is cut.

STATE NEWS

West Virginia

No organized effort had ever been attempted in this state to control the forest fires until the enactment of the law of 1909, and while the system is yet imperfect, the money that has been saved in forest products in the past four years is astonishing, says Forest, Game and Fish Warden J. A. Viquesney in his annual report. He adds:

Data collected on forest fires by the United States Forest Service for the year of 1908 was alarming in the extreme, and to avert some of this destruction the law of 1909 was enacted. The following is taken from the Government report of 1908:

"The first serious fire occurred August 28th, and from that time there was no cessation for three months. Every county in the state was visited by fire, but in some instances only a few acres were burned. The total number of fires reported was 710; the number of men called out to fight was 5,821; the cost to the county treasuries, so far as reported, was $646; the expense incurred in fighting fire by individuals and companies was $89,100; the area burned was 1,703,850 acres; the standing timber burned was 943,515,000 feet, board measure, worth $2,903,500. The lumber, tan-bark, and improvements burned were valued at $490,175; the injury to undergrowth and soil was placed at $1,703,850 and the loss from forest fires in the state made the grand total of $5,097,825. More than one-tenth of the whole surface of the state was burned over, and one-fifth of the forest area. Three per cent of the estimated standing timber in West Virginia was destroyed, including the small as well as the large; and the amount burned was two-thirds as much as the cut of all the mills in the state in 1907."

The total number of fires which occurred during the years 1909 and 1910 was 293; number of acres burned over 182,730; value of timber and forest products destroyed, $150,927.19; amount expended in extinguishing fires, $4,983.28.

Total number of fires in the years 1911 and 1912 was 113; number of acres burned over 65,156; amount of timber and forest products destroyed, $64,547.49; amount expended in extinguishing same, $2,290.02.

Thus it will be seen that for the entire four years we had a total of 406 fires; acres burned over 247,886; value of timber and other forest products destroyed, $215,474.68; amount paid for extinguishing fires, $7,173.30.

Comparing the above figures with those for 1908, it will be seen that more than $5,000,000 has been saved annually by reducing this fire destruction, and in the four years enough has been saved to pay all expenses of running the state government for the past sixteen years. It might be said that the year 1908 was extremely dry, and for this reason the fire loss was greater. This is true, but the year 1911 was equally as dry, and had it not been for the special effort in fighting these fires, the loss would certainly have been as great as for the year 1908.

Pennsylvania

The Pennsylvania Department of Forestry has just purchased 7,000 acres of what is known as the Pine Grove tract in Cumberland along the South Mountains.

The students at the State Forest Academy, Mont Alto, had their Christmas vacation from December 20, 1912, to January 6, 1913.

Part I of Forester's Manual has been published by the Department. This will be followed by other parts as rapidly as the material can be prepared.

Four of the Pennsylvania foresters are now in Washington finishing up the work on the utilization survey which was made by the State of Pennsylvania this fall in cooperation with the U. S. Forest Service.

The Pennsylvania Chestnut Tree Blight Commission has just issued for the information of the public, Bulletin No. 1, a brief, illustrated publication giving the means of identifying the chestnut blight disease and suggesting remedies for its control and eradication.

The interesting document points out the great danger of extermination that menaces Pennsylvania's vast chestnut resources, and urges a prompt and vigorous co-operation generally in the effort in progress to stamp out this new, but terribly destructive pest of our native chestnut trees.

The disease has already entailed losses to timber owners in Pennsylvania amounting to fully ten millions of dollars, having been especially virulent in Southeastern Pennsylvania, where thousands of both old and young chestnut trees were killed by the blight. West of the Allegheny Mountains, a concentrated effort on the part of the employees of the Commission and with the cooperation of timber owners and others, the blight will practically be wiped out by the close of the year, thus giving the assurance that a large portion of Pennsylvania's many millions of dollars' worth of chestnut may be saved and the disease checked before it can spread into the valuable timber of adjacent states.

Maryland

The last Legislature appropriated to the State Board of Forestry $50,000 for the purchase of lands along the Patapsco River as a State Forest Reserve. The money becomes available on January 1st, and the State Forester has already begun active work towards acquiring lands. Two small tracts in the vicinity have been offered as gifts to the state. The state has a small forest reserve on the Patapsco River so that the lands to be acquired under the new appropriation will greatly increase the size of this reserve. It is intended to purchase the land on both sides of the river to the top of the rather prominent bluffs which line it on either side. The region is very picturesque, with forested slopes and numerous small streams breaking through the walls of the gorge in beautiful waterfalls.

A road of easy grade traverses the valley, making it thoroughly accessible. Since the nearest point is less than eight miles from Baltimore, the Patapsco Reserve is likely to become a recreation ground for thousands of people. A reserve of this character will be more of a state park than a true forest reserve. It will, however, be kept as far as possible under forest conditions and will, by its accessibility to a city of 600,000 people, interest a large number of persons in forestry who could not otherwise be reached.

California.

The Fourth Biennial Report of the State Forester of California was transmitted to the Governor on December 5. It deals with administrative, educational and constructive problems, pertinent to forestry. The general attitude of the report is in accord with the nation-wide movement which is seeking to conserve, through wise use, the resources of our forests. Appropriations have been made to carry on forestry work in twenty-two states of the Union. Only fourteen, however, have provided sufficient funds to permit the development of national forest policies. These devote special attention to the suppression of forest fires; insect and fungi depredations; and the carrying on of special studies and investigations with a view of stimulating the practice of forestry on private lands and promoting a better knowledge of forestry and forest resources. No appropriation has yet been made for fire protection in California. Recommendations have been made for an appropriation of $132,500 to prevent and suppress forest fires, and for an additional $10,000 in the support fund of the board. This is to permit the continuation of forest investigations and studies already begun, and for the commencement of additional ones. These appropriations are most essential—they provide for two years. As much of the amount recommended as is consistent with the needs of other state departments and institutions should be appropriated.

The owners of timbered and cut-over lands have been determined, as accurately as was possible, from the county assessors' records. The acreage of each owner, whose holdings aggregate 2000 acres or over, is given. Forty-two per cent of the privately owned timbered and logged-off land is owned or controlled by ten companies.

In order to determine existing conditions of privately owned timbered and logged-off land, a study was made which extended over half a million acres. Forestry is not being practiced on the areas examined. The annual cut is made without reference to the yield, and the future crop is left largely to chance. Much waste that could be avoided is in evidence. Perfected fire patrol systems are not generally maintained. Cut-over areas need greater protection from fire. Tops and lops, resulting from logging, are burned in a few cases. Slash constitutes a grave menace and should be more generally burned. Nearly five million acres of once timbered land have given way to chaparral growth because of cutting without reference to the future and repeated ground fires, and, owing to this indifference, this land cannot now reproduce another merchantable crop without resorting to artificial reforestation. This study should be continued until all of the cut-over lands have been examined.

The present method of taxation is not adapted to forest investments. A dozen states have sought, through legislation, to stimulate planting on prairie and waste land and when certain conditions are fulfilled, the owner receives a reward in the form of a premium, prize, bounty or rebate. These laws are not directed toward the evils that have developed through a lax and haphazard enforcement of the present system. California has no special forest taxation law. The forests, if they are to be perpetuated, must be taxed under a method devised for their needs. The ground supporting a growing crop should be taxed, but not the timber. This should be taxed when it is cut and yields a revenue with which to pay. This is the method toward which we should work. Further study is needed, and emergency measures may be necessary to prevent the hastening of cutting timber in special cases.

The principles underlying the management, protection, replacement, utilization and preservation (all mechanical processes) have been discussed briefly. Cutting systems employed in securing natural replacement have been touched upon as well as the procedure adopted in measuring the forest crop.

Special papers on forestry are presented by members of clubs and associations.

Suggestions are given to the prospective forest student that he may know where forestry is taught; entrance requirements; field of study and employment. The progress report on street and highway planting indicates the advisability of municipal control of shade trees.

North Carolina

In 1911 the State Legislature passed a law requiring the commissioners of Moore County, North Carolina, to elect and appoint one forest warden for the county and one deputy forest warden for each township in the county, which, in their judgment, required the services of such deputy forest warden. These wardens were to prevent and extinguish forest fires, to investigate the causes of any fires, to make arrests and prosecute for violation of the forest laws, to post notices, etc.

This law has been carried out with some considerable success. Wardens were appointed by the commissioners, some of whom have done good work in preventing and extinguishing fires. A large landowner in that county writes that one or two arrests have been made and that he feels sure the law has been effective. There are still some fires, of course, but they are not as bad as they were. Whether this is due to the fact that there is more land cleared than there was a year or two ago, or whether it is due to the improved roads, which make good lines from which to fight fires, he does not know. The fact, however, that a man has been appointed to investigate the origin of fires and given the power to prosecute has accomplished more than any actual results that can be shown. It is the first systematic attempt on the part of the local government to control forest fires in North Carolina, and it is hoped that it will form a starting point for the passage of a state-wide law at the next session of the Legislature.

The annual meeting of the State Farmers Union, which met in Raleigh, December 10-12, passed strong resolutions calling upon the State Legislature to pass fire-protective laws. The fact that this body of men, which represents some 50,000 progressive farmers, through eighty-five counties of the state, has taken hold of this matter, promises well for the success of the movement now on foot to secure adequate forest laws. The greater part of the woodland of the state is owned by the farmers. Now that they are realizing that fire protection is necessary, there seems to be a good chance of getting something done.

Kentucky

Considerable of the time of the State Forester the last month has been devoted to talks before the various Farmers' Institutes, which have been in progress throughout the state for several weeks past and will continue during January. These institutes offer an excellent opportunity to get into touch with local conditions throughout the various counties of the state.

The arboretum for the state which was begun on Arbor Day, November 13, on the grounds back of the new state Capitol, has started out most propitiously and already over one hundred and fifty trees and shrubs native to the state have been received and planted. A booklet commemorating the Arbor Day exercises and the beginning of the arboretum is in the process of publication.

Mr. W. D. Sterrett, Forest Assistant in the Forest Service, called at the office of the State Forester early in the month in connection with his study of the ashes in this region of the United States. In view of the fact that there are eight species of ashes found within Kentucky, the state apparently offers an excellent field for such a study, and it is expected to continue the work in this connection next summer by co-operation between the state and the federal Forest Service.

Minnesota

The Minnesota State Forestry Board, at a meeting on December 4, adopted the following resolution asking an additional appropriation under the Weeks Law for the protection of forested watersheds at the headwaters of navigable streams:

WHEREAS, the Congress of the United States, in the passage of the Weeks Law, recognized the duty of the Federal Government in protecting the headwaters of navigable streams by preserving the forests at their sources; and

WHEREAS, under the terms of the aforementioned Weeks Law, the Federal Government has been co-operating with the State of Minnesota in protecting from fire the forests at the headwaters of the Mississippi River, the Red River of the North, and other navigable streams of this state, splendid results having been accomplished through such co-operation; and

WHEREAS, it appears that the fund at the disposal of the Federal Forest Service is insufficient to continue co-operation on the same scale as it has been conducted during the past two years; now, therefore, be it

RESOLVED, That the Minnesota Delegation in Congress be asked to obtain, if possible, an additional appropriation to be expended under the terms of the Weeks Law in the protection of forested watersheds at the headwaters of navigable streams.

New York State

The top-lopping law has been the cause of a great deal of discussion throughout the state of late. As the penalty for failure to lop tops was removed at the last legislature, there has been more or less of a question as to whether it should be advisable to continue this law in force in the future. Several hearings have been held in different parts of the Adirondacks at which the lumbermen have been very generally opposed to the top-lopping law, while other interests have been largely in favor of it. After the hearings a field trip of about ten days was taken in order to determine the actual benefits derived from the lopping of tops.

There has been a great deal of talk about modifying this law should it remain in force. This modification would consist in lopping the branches from the top down to a certain diameter, the theory being that the small end, being made up mostly of sap wood, would really disappear as quickly as many of the larger lopped branches.

Two new bulletins are nearly ready for the press, Bulletin 9, on Woodlot Work, and Bulletin 10, on Forest Fire Protection. These two bulletins will make the list of state publications quite complete, as far as daily requests for information is concerned.

New York State bulletins now available are as follows: Bulletin No. 1, Forestry and the Forest Resources in New York State; Bulletin No. 2, Reforesting; Bulletin No. 3, Cultivation of Basket Willow; Bulletin No. 4, The Forest Conditions of Oneida County; Bulletin, No. 5, A Syllabus for Lecture on Forestry; Bulletin No. 6, Forest Conditions of Warren County; Bulletin No. 7, Shade Trees; Bulletin No. 8, Forest Taxation.

City forests, although not being developed purely as such, will most certainly commonly exist in New York State within many years. Already there are many cities of the state that have taken this question up most seriously, but in all cases it has been through the reforesting of the watersheds of the city water supply where it has been owned by the community.

The following cities have already done more or less planting on the watersheds of their municipal systems, New York City, Glens Falls, Gloversville, Ilion, Poughkeepsie, Valhalla, Waterville, Carthage, Salamanca and Middletown.

Within the last month or two Troy has seriously taken up this question. On the watershed of the Troy system there are already about 100 acres of mature timber which will be cut this coming winter under the direction of the Conservation Commission, and the money derived from this sale will be largely, if not wholly, put back into reforestating about 300 acres of open farm land which surrounds the resevoir. Inasmuch as forest conditions already exist on this watershed, this will be an excellent example of the possibilities of forestry and serve as an excellent demonstration forest for the people of that vicinity.

Just on the outskirts of Albany, there are about 100 acres of forest land which has been put under the care of the Conservation Commission to be managed and cut in a scientific manner. This forest will serve as an excellent and easily accessible demonstration area for the people of Albany.

Colorado

A co-operative agreement has just been entered into between the State Board of Agriculture and Forestry of Colorado and the Forest Service for better forest fire protection in this state. Under the terms of this agreement, all state and county fire wardens are to report the occurrence of all fires as soon as discovered to the forest officers and in like manner forest officers report the occurrence of fires to state and county wardens. In case of fires on the National forest reserves, county and state wardens can fight such fires and be paid by the Forest Service, without previous notification. Forest officers can call to their aid county fire wardens and the latter can, in turn, call upon the forest officers for aid in fighting fires whenever their official duties will permit.

In this way, it is believed that a wider interest in forest fire protection will be secured, together with harmonious working between the state and federal forest officers.

Connecticut

The Connecticut General Assembly of 1911 authorized the appointment of a Special Commission to investigate the subject of taxation of woodland in the state, and to report its findings to the General Assembly of 1913 with recommendations as to needed changes in legislation. This Commission was to include the Tax Commissioner and the State Forester with three other members appointed by the Governor. As organized, the commission consisted of Ex-Gov. Rollin S. Woodruff, Chairman; Former State Forester S. N. Spring, Secretary; Tax Commissioner William H. Corbin; Prof. Herman H. Chapman, of the Yale Forest School, and Mr. Frank H. Stadtmueller, Secretary of the Connecticut Forestry Association. Prof. F. H. Fairchild of Yale University, although not a member of the Commission, has assisted it greatly in an advisory capacity.

After several organization meetings and a public hearing, State Forester Spring was authorized to gather necessary data for the Commission. Three field assistants were employed during July and August in preparing forest maps of three typical towns of the state, and in securing information from local tax officials. This information will be published soon as a report to the General Assembly, and will be accompanied by recommended changes in the tax laws of the state which, if adopted, will assure forest land owners against any possibility of unjust taxation. Connecticut is to be congratulated on the efficient commission which has this matter in charge. Its report will be awaited with interest by all friends of forestry.

Oregon

Oregon can justly take pride in the achievements brought about during the past two years under the new forestry law. Two hundred miles of new trail have been made, 650 miles of old trail opened up and put in shape for use, 200 miles of telephone line built for the use of lookout and patrolmen, 14 lookout points equipped with telephones,

and a large number of lookout points put into use with telephone stations nearby. The regular patrol work is being supplemented with lookout stations, and in the most favored localities it is hoped will very largely be superseded by them. This work has not been done with funds from the State appropriation, but has very largely come about through the supervision of State employes with funds furnished by private timber owners, and local associations, and the labor of patrolmen paid from the Weeks Fund. Through these same agencies there have been some 20,000 acres of old slashings burned, fire lines cleared around cuttings that have not been cut clean so that wholesale burning could be done, and a vast amount of annual slashings burned. This leaves the timbered area of the State in better shape for entering the next fire season than it has ever been in the past. Climatic conditions are such, however, that it is very difficult to select times for burning slashings and refuse left after logging, when it can be done with absolute safety to surrounding property, and the greatest of care is required in this branch of fire protective work.

South Dakota

South Dakota will organize its Forest Service this present winter preparatory to taking up the active administration of its newly acquired forest lands with the New Year.

The State forests consist of 60,000 acres of well-timbered lands acquired from the National Government in exchange for school lands granted to the State under its constitution and afterward appropriated by presidential proclamation as forest lands, without remuneration to the State.

For the purpose of administration the lands are divided into the Custer forest, and the Camp Crook Forest, there being beside several isolated sections of 640 acres each.

The Custer forest, comprising 48,000 acres of mature Western yellow pine, is located in the Harney Peak district, mostly on the French and Squaw Creek divides. This land was formerly a part of the Harney National Forest and was eliminated by presidential proclamation February 15, 1912. It carries a magnificent and almost pure stand of mature yellow pine and embraces some of the finest timber in the Black Hills.

The Camp Crook Forest comprises 12,000 acres of land in the Short Pine Hills in the northwestern part of the State and was formerly a part of the Sioux National Forest. It is mostly well covered with a good stand of immature or inferior yellow pine the commercial value of which as sawtimber has not yet been determined or developed.

Both forests offer excellent grazing facilities and the Custer Forest, particularly, is abundantly supplied with water in the shape of beautiful creeks and springs. Game and fish exist in considerable numbers in both forests.

Negotiations are under way for the sale of approximately 125,000,000 feet, board measure, of the mature pine on the Custer Forest, and a sale of 5,000,000 feet has already been made on one of the isolated sections on Rapid Creek near the holdings of the Lanphere-Hinrichs Lumber Company.

The State forests are administered as a division of the Department of School and Public Lands under regulations adopted by the Board of School and Public Lands, a board composed of the Governor, the Secretary of State and the Commissioner of School and Public Lands. The forest lands will be administered under a plan and policy based upon the regulations governing National forests, but modified to meet State requirements and local conditions.

The needs of the Forest Division will be presented to the Legislature in January by the Department and the Forester, and an effort will be made to secure an appropriation and legislation which will permit of administering the Forests in a manner admitting of present returns and conservation for future income.

The Forest Service will be placed upon a civil service basis and be headed by State Forester George W. Roskie, a man of practical woods experience and knowledge and a graduate of the State College.

Michigan

At the annual meeting of the Michigan Forestry Association recently held at Saginaw resolutions were adopted calling upon Governor-elect Ferris and the members of the incoming legislature to take definite steps to prevent the depletion of Michigan forests. The association is endeavoring to secure more effective laws and to take the regulation of forest out of the realm of politics.

John H. Bissell, of Detroit, newly elected vice-president, is a charter member, having held office continuously since the inception of the society. Henry G. Stevens, assistant secretary, was also one of the organizers of the association. Both of these gentlemen have given the subject of conservation careful study and the best means of promoting it in Michigan.

DECREASED DAMAGE BY FIRE.

Forest fires burned over 171,620 acres in Pennsylvania in 1911, the total loss being given as $638,279. During the present year the indications are that the damage will be considerably reduced. While the decrease is a source for congratulation, this useless waste should be almost, if not entirely, suppressed, and the efforts in this direction should not be relaxed.

EDUCATIONAL

Forest Ranger Course

Mr. F. B. Moody, who for seven years has been Assistant State Forester, has been appointed an Assistant Professor in the University of Wisconsin, and will have charge of the course for forest rangers in the College of Agriculture, which starts January 7, 1913. The Ranger School will also include instruction to both long and short course students in agriculture, in the care of woodlands, especially the management of farm woodlots. The practice of forestry by the owners of timber land, the organization and rapid development of definite forest policies by the States and the organization of forest fire protective associations, are bringing about a demand for young men who have had practical training in Forestry. It will be the aim of the Ranger School to meet this demand by preparing men for such secondary positions as rangers, guards, tree-planting experts, nursery foremen, and other positions with lumber companies, commercial nurserymen, and the owners of timber estates. Young men who have already gained some experience in wood-craft and in practical lumbering operations will find this course of especial value, as they will receive training which will fit them for the more expert quality of service which is demanded by modern methods of handling timber holdings.

This two-year course is not offered as a complete education in Forestry. On satisfactorily completing the course, the student will be a trained ranger or guard, or an expert in tree planting and forest nursery practice, but he will not be a professional forest engineer.

The life of a ranger is a life in the woods, and no one should enter the school with any misunderstanding in this respect. Students who are not physically able to do hard woods work and who do not care for the rough outdoor life, are advised not to enter the course.

The Ranger Course will be offered in co-operation with the State Board of Forestry, field instruction being given on the State forest reserves. It is not expected, however, that the men trained in this work will be used exclusively in the State Forest Service.

By this co-operation with the State Board of Forestry, special facilities are offered for the student to gain practical training in forestry. A term of instruction will also be given each year at the College of Agriculture, thus providing facilities for instruction not only in Forestry, but also in the other closely allied subjects.

The State forest reserves now comprise about 400,000 acres, principally located at the headwaters of the Menominee, Wisconsin and Chippewa rivers, in the counties of Forest, Oneida, Vilas, Iron and Price. The reserves are divided into districts with a forest ranger or patrolman in direct charge of the field work in each district.

Georgia Forest School

The Georgia Forest School began its seventh session in September. Each session marks an advance in attendance. This year there are 48 students in the courses in farm forestry and 9 in the professional courses.

Since the session opened two trips have been made under the co-operative agreement with landowners. One of these to Columbia county, lasted a week. The students are getting considerable practice from these trips and an opportunity to visit different parts of the state.

Sample thinnings are in progress in Madison county, in second growth pine.

The school was called in last year to estimate damage by fire, news from which case is just received. The owner was offered $100, which he refused, and asked help from the school. An estimate was made, placing the damage at $448.11. The owner got $414—rather better than $100?

Penn State Forest School.

There have been several changes in the personnel of the teaching staff in the Department of Forestry, Pennsylvania State College. A keen sense of loss was experienced in the resignations of Professor Hugh P. Baker, now Dean of Forestry, Syracuse University, and Professor W. D. Clark, now Professor of Forestry, Amherst; but other good men have come to fill the vacancies. Professor J. A. Ferguson, who directed affairs in the Department of Forestry at Penn State, during the absence in Europe of Professor Baker, during the past year Professor of Forestry, at the University of Missouri, has accepted an appointment as Professor of Forestry, Penn State Forest School, and will take up his new duties in the near future. Instructors R. R. Chaffee and J. B. Berry, appointed while the school was under the leadership of Professor Baker, remain to carry on the work of the school and assist Professor Ferguson. Both men have had wide experience in the United States Forest Service and in teaching and are especially well qualified to handle their respective lines of work. The staff has been further reinforced by the addition of a new man, George R. Green, a graduate of Michi-

gan University, Class of '10. During the past year Mr. Green has acted as Assistant State Forester of Ohio. He has taken as his work the courses in Forest Law, Dendrology, Farm Forestry and assistant in Silviculture.

From the time the Forest School was established, 1906, under the leadership of Dr. B. E. Fernow, it has gradually increased in size and importance until at present it is recognized as one of the foremost Forest Schools of the United States.

Death of Dr. William A. Buckhout, U. S., D. Sc.

Dr. William A. Buckhout, Professor of Botany and the Senior Professor at the Pennsylvania State College, died of heart disease on Tuesday, December 3, 1912. Dr. Buckhout was born in December, 1836, and graduated from the Pennsylvania State College in 1868. In 1871 he became Professor of Botany and Horticulture in this college. In the changes brought about in agricultural sciences during recent years he became Professor of Botany. For many years he was Botanist of the Pennsylvania State Board of Agriculture. In 1888 he was appointed to the Pennsylvania State Forestry Commission and was a prime mover in the State in creating and taking an active interest in Forestry. He was a Fellow of the American Association for the Advancement of Science. He was author of papers such as "The Chestnut as a Fruit and Food," "The Effect of Smoke and Gas on Vegetation," "A Microscopic Examination of State College Water Supply," "Forest Fires," and others, with annual reports as State Botanist.

He was a true professor in all good meaning of the word. No man was ever more faithful to his duty than was Dr. Buckhout. He conducted classes to the last, having taught for over forty-one years, a record of which few can boast. To use the words of a psalmist,

"And in old age when others fade,
He still forth fruit shall bring."

Being an untiring student, he was a man of great breadth of learning, a most excellent teacher, ambitious to give his best to his classes, endeavoring to make them shrewd and accurate observers of nature;—an investigator whose attainments are little known, because of his modesty. He frequently determined scientific facts which were not published. Other investigators became famous later in discovering the same things. He determined the relation between the nodules of legumes and bacteria just previous to the same discovery by Helriegel and Wilfarth, of Germany.

Being a man of high ideals and congenial ways, he was loved by all, and not only will the scientific world mourn his death but every professor, student or citizen of Pennsylvania, who has come in contact with him. The value of his services to the state cannot be measured. The people of Pennsylvania will join with his family in mourning his death.

IMPROVING NATIONAL PARKS

In order to have the national parks of the West in shape to care for tourists expected during the year of the Panama Pacific Exposition, Secretary Fisher of the Interior Department estimates that an expenditure of $733,000 *will be needed in addition to the* $228,000 *that Congress granted for use this year.*

"The national parks," says the Secretary, "constitute ideal recreation grounds for thousands of people, but the development and use of the parks are seriously retarded by the lack of adequate roads and trails, and until sufficient money is appropriated for beginning a comprehensive plan of development the parks will fall far short of rendering the important use for which they are intended."

TWO MILLION TREES SET OUT

Nearly 2,000,000 *young trees were set out in Pennsylvania forest reserves in* 1912, *according to the annual report of the Executive Council of the Pennsylvania Forestry Association, just issued. The report says:*

"The Department of Forestry has now 974,891 *acres of land in reserves, of which* 8595 *acres were purchased in* 1912, *and the important work of administering them has been advanced as far as possible. Parts have been thinned out, the weed trees removed, roads either reopened or built, fire lanes made, and most important additional acreage planted with young trees."*

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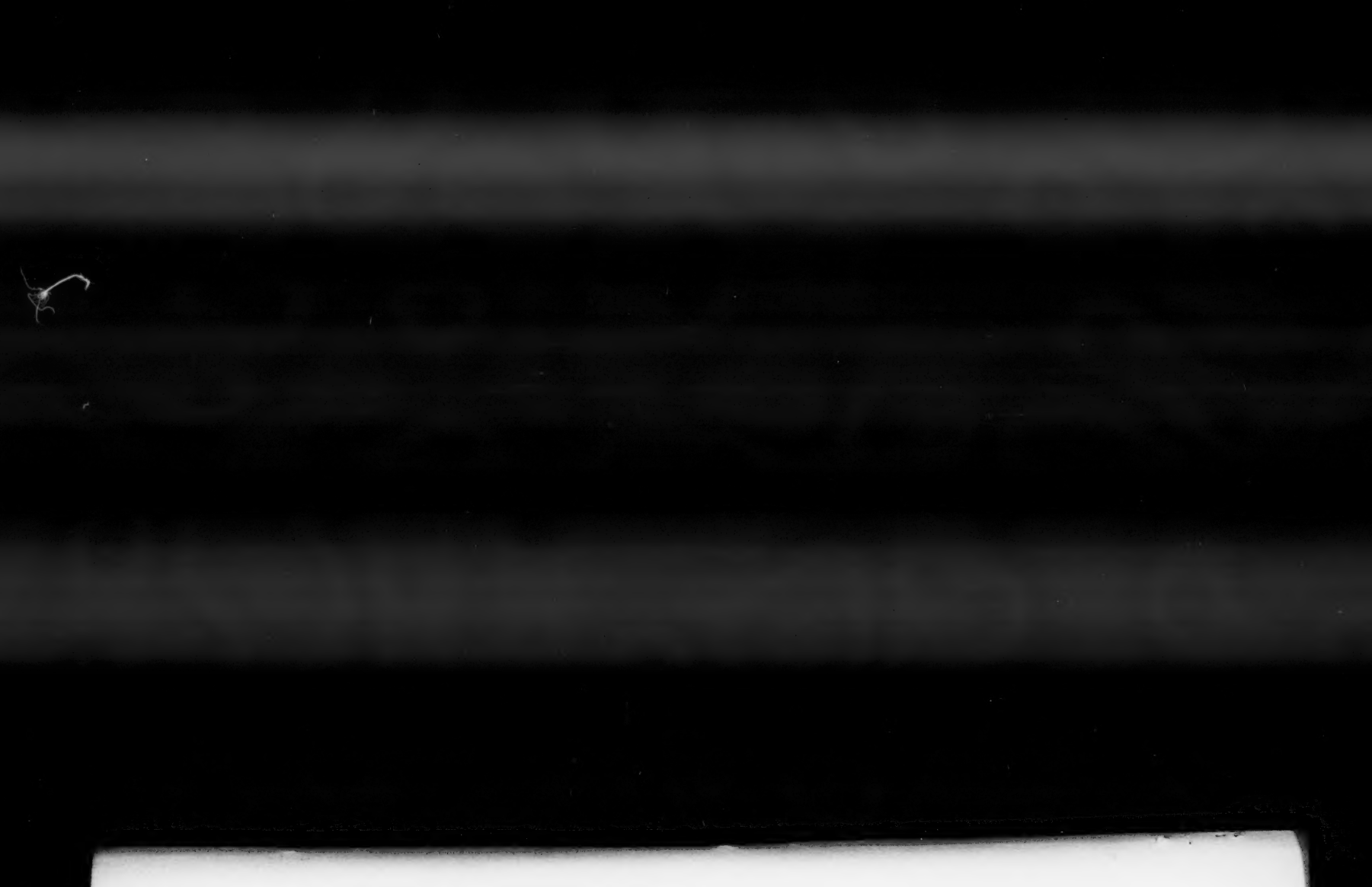
SECRETARY FISHER'S RECOMMENDATIONS

A definite and comprehensive water power policy for streams upon the public domain and navigable streams not upon the public domain is urged by the Secretary of the Interior, Walter L. Fisher.

Other recommendations contained in his annual report to the President, are epitomized as follows:

Comprehensive classification of public lands, and administration in accordance therewith.

Enlarged application of leasing principle to the public domain generally.

Amendment to mining law giving prospector exclusive right for a term of years of possession and prospecting within limited area.

Withdrawal from entry of public lands in West to protect headwaters of streams.